COMPAQ

ProLiant ML330e/ML330 Server

Maintenance and Service Guide

Fourth Edition (March 2001)
Part Number 174623-004
Spare Part Number 176670-001
Compaq Computer Corporation

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About This Guide

This maintenance and service guide is a troubleshooting guide that can be used for reference when servicing the Compaq ProLiant ML330e/ML330 server.

WARNING: To reduce the risk of personal injury from electric shock and hazardous energy levels, only authorized service technicians should attempt to repair this equipment. Improper repairs can create conditions that are hazardous.

Symbols in Text

These symbols may be found in the text of this guide. They have the following meanings:

WARNING: Text set off in this manner indicates that failure to follow directions in the warning can result in bodily harm or loss of life.

CAUTION: Text set off in this manner indicates that failure to follow directions can result in damage to equipment or loss of information.

IMPORTANT: Text set off in this manner presents clarifying information or specific instructions.

NOTE: Text set off in this manner presents commentary, sidelights, or interesting points of information.

⚠ Important Safety Information

Before installing this product, read the *Important Safety Information* document provided.

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Compaq Technician Notes

WARNING: Only authorized technicians trained by Compaq can attempt to repair this equipment. All troubleshooting and repair procedures are detailed to allow only subassembly/module-level repair. Because of the complexity of the individual boards and subassemblies, no one should attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs can create a safety hazard.

WARNING: To reduce the risk of personal injury from electric shock and hazardous energy levels, do not exceed the level of repair specified in these procedures. Because of the complexity of the individual boards and subassemblies, do not attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs can create conditions that are hazardous.

WARNING: To reduce the risk of electric shock or damage to the equipment:

- Disconnect power from the system by unplugging all power cords from the power supplies.
- Do not disable the power cord grounding plug. The grounding plug is an important safety feature.
- Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.

CAUTION: To properly ventilate the system, you must provide at least 7.6 cm (3.0 in.) of clearance at the front and back of the server.

CAUTION: The server is designed to be electrically grounded (earthed). To ensure proper operation, plug the AC power cord into a properly grounded AC outlet only.

NOTE: Any indications of component replacement or printed wiring board modifications may void any warranty.

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Where to Go for Additional Help

In addition to this guide, the following information sources are available:

- User documentation
- *Compaq Service Quick Reference Guide*
- Service training guides
- Compaq service advisories and bulletins
- Compaq *QuickFind*™ information services
- Compaq Insight Manager software

Integrated Management Log

The ProLiant ML330e/ML330 server includes an integrated, nonvolatile management log that contains fault and management information. The contents of the Integrated Management Log (IML) can be viewed with Compaq Insight Manager or the Web-based management tool, whicb is located on the Compaq Utilities tab of the browser-based management tool.

Telephone Numbers

For the name of your nearest Compaq authorized reseller:

- In the United States, call 1-800-345-1518.
- In Canada, call 1-800-263-5868.

For Compaq technical support:

- In the United States and Canada, call 1-800-OK COMPAQ.
- For Compaq technical support phone numbers outside the United States and Canada, visit the Compaq website:

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Chapter 1

Illustrated Parts Catalog

This chapter provides the illustrated parts breakdown and spare parts lists for the Compaq *ProLiant*™ ML330e/ML330 server with an Intel Pentium III processor and a 133-MHz system bus. See Table 1-1 and Table 1-2 for the names of referenced spare parts.

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Mechanical Parts Exploded View

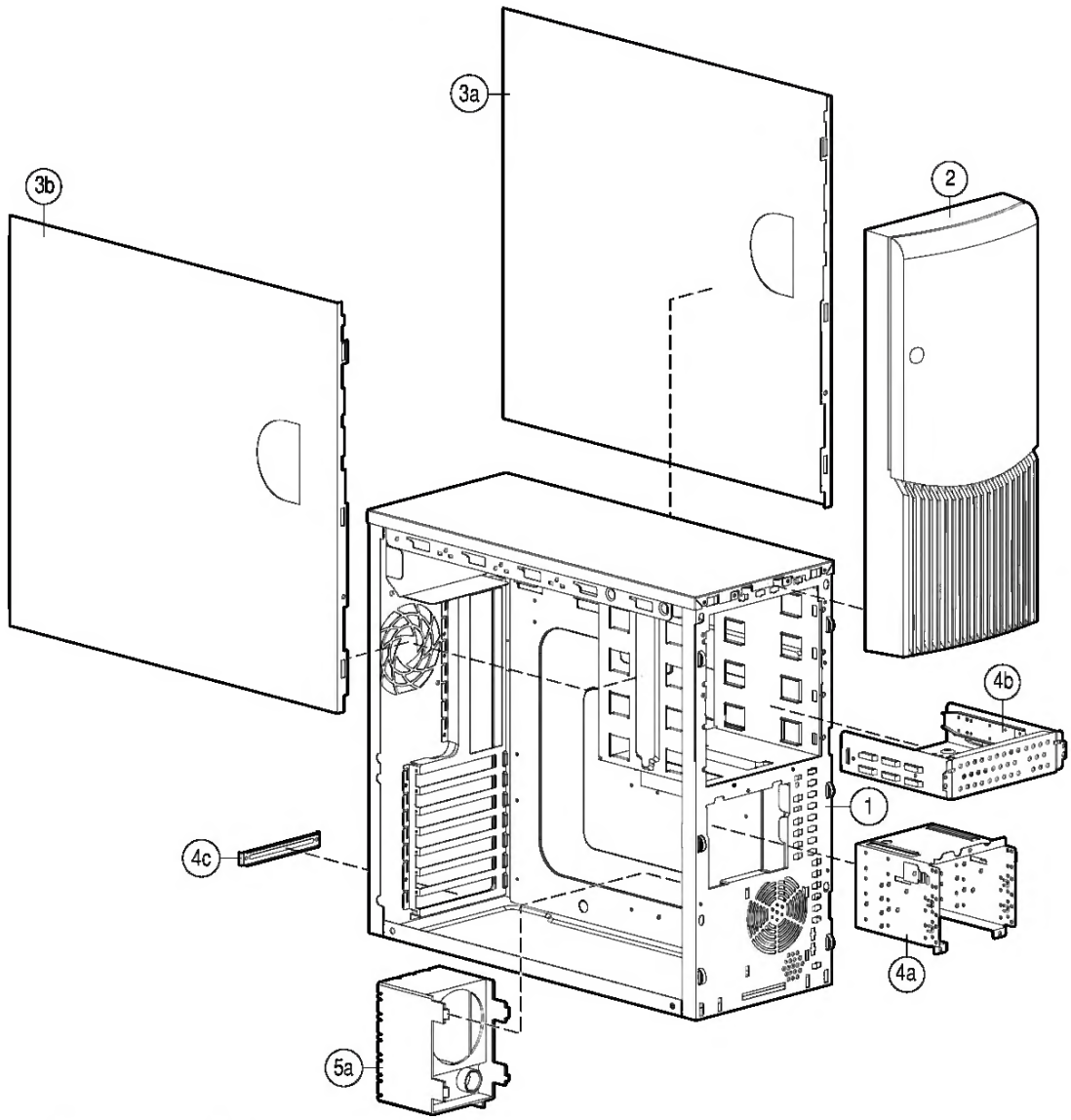

Figure 1-1. Mechanical parts exploded view

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Mechanical Spare Parts List

Table 1-1
Mechanical Spare Parts List

Item	Description	Spare Part Number
	Chassis	
1	Chassis assembly	176605-001
2	Front bezel	
	ProLiant ML330e server	230542-001
	ProLiant ML330 server	176604-001
3	Panel access left/right	176606-001
	a) Hood panel (right)	
	b) Access panel (left)	
	Miscellaneous	
4	Hardware kit	176618-001
	a) Hard drive compartment	
	b) Removable drive tray	
	c) Expansion board knockout	
5	Miscellaneous plastics kit	176617-001
	a) Expansion board guide	
	b) Rubber bumpers*	
	c) Removable media bezel blank*	
	d) Cable clips*	
	e) Miscellaneous clamps*	

*Not shown

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System Components Exploded View

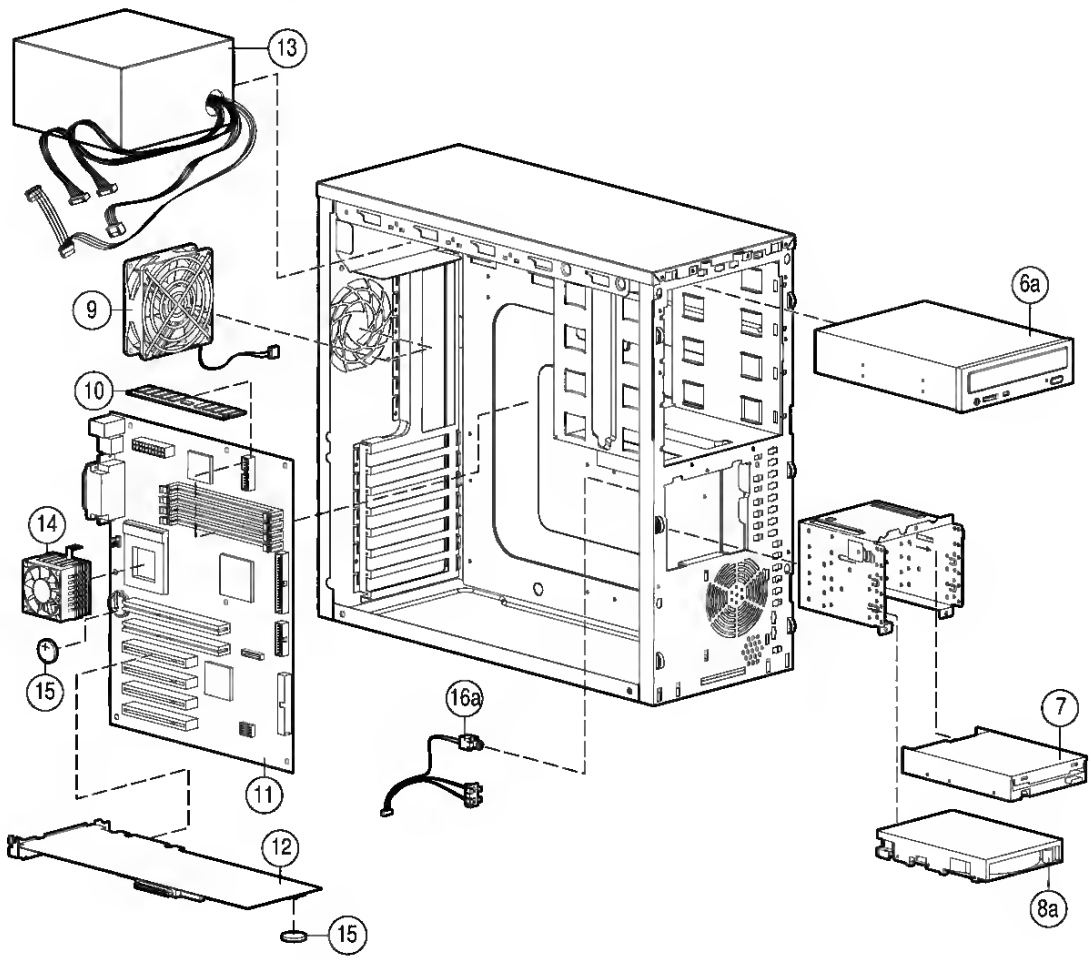

Figure 1-2. System components exploded view

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System Components Spare Parts List

Table 1-2
System Components Spare Parts List

Item	Description	Spare Part Number
	Mass Storage Devices	
6	IDE CD-ROM drive	
	a) IDE CD-ROM drive x32	163354-001
	b) IDE CD-ROM drive x40*	179963-001
7	Diskette drive	123958-001
8	Hard drive	
	a) 20-GB ATA hard drive (ML330e model)	230699-001
	b) 9.1-GB Wide Ultra2 hard drive (ML330 model)*	349534-001
	System Components	
9	Fan	176609-001
10	PC 133-MHz ECC Registered SDRAM DIMM	
	a) 64-MB*	159225-001
	b) 128-MB*	159226-001 164278-001
	c) 256-MB*	159304-001 159377-001
	d) 512-MB*	159227-001 177628-001
	Boards	
11	System board	
	ProLiant ML330e server	230540-001
	ProLiant ML330 server	176615-001
12	Server Feature Board	
	ProLiant ML330e server	230541-001
	ProLiant ML330 server	176608-001
	Power	
13	CE Mark-compliant power supply	176616-001

*Not shown

continued

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Table 1-2
System Components Spare Parts List *continued*

Item	Description	Spare Part Number
14	Pentium III processor	
	a) 667/133 with heatsink*	176610-001
	b) 733/133 with heatsink*	176612-001
	c) 800/133 with heatsink* (ProLiant ML330e and ML330)	176613-001
	d) 866/133 with heatsink*	176614-001
	e) 933/133 with heatsink* (ProLiant ML330e and ML330)	202350-001
	f) 1-GHz/133 with heatsink*	217827-001
15	CR2032 lithium coin cell battery	234556-001
16	Power cable kit	176619-001
	a) Power button assembly	
	b) Power shield cable*	
	c) Power extension cable*	
	Miscellaneous	
17	Enhanced keyboard*	386209-001
18	Signal cable kit*	176620-001
	a) IDE ribbon cable assembly	
	b) Diskette drive cable assembly	
	c) Server Management Information Cable (SMIC) connector assembly	
19	ATA cable assembly*	231702-001
20	Heatsink fan assembly* (for 1-GHz model only)	220997-001
21	Ultra2 SCSI cable*	176607-001
22	Country kit*	178196-001
23	Return kit*	176621-001
24	Maintenance and service guide*	176670-001

*Not shown

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Chapter 2

Removal and Replacement Procedures

This chapter provides subassembly/module-level removal and replacement procedures for the Compaq ProLiant ML330e/ML330 server. Run the diagnostics program to verify that all components properly operate.

To service the ProLiant ML330e/ML330 server, you might need the following:

- Torx T-15 screwdriver
- Phillips screwdriver
- From the Compaq *SmartStart*™ and Support Software CD:
  - Array Diagnostics Utility (ADU)
  - Diagnostics software

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Electrostatic Discharge Information

An electrostatic discharge (ESD) can damage static-sensitive devices or microcircuitry. Proper packaging and grounding techniques are necessary precautions to prevent damage. To prevent electrostatic damage, observe the following precautions:

- Transport products in static-safe containers such as conductive tubes, bags, or boxes.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free stations.
- Cover workstations with approved static-dissipating material. Use a wrist strap connected to the work surface, and properly grounded (earthed) tools and equipment.
- Keep work area free of nonconductive materials, such as ordinary plastic assembly aids and foam packing.
- Make sure that you are always properly grounded when touching a static-sensitive component or assembly.
- Avoid touching pins, leads, or circuitry.
- Always place drives with the Printed Circuit Board (PCB) assembly-side down.
- Use conductive field service tools.

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Symbols on Equipment

These symbols may be located on equipment in areas where hazardous conditions may exist.

This symbol, in conjunction with any of the following symbols, indicates the presence of a potential hazard. The potential for injury exists if warnings are not observed.

This symbol indicates the presence of hazardous energy circuits or electric shock hazards. Refer all servicing to qualified personnel.

WARNING: To reduce the risk of injury from electric shock hazards, do not open this enclosure. Refer all maintenance, upgrades, and servicing to qualified personnel.

This symbol indicates the presence of electric shock hazards. The area contains no user- or field-serviceable parts. Do not open for any reason.

WARNING: To reduce the risk of injury from electric shock hazards, do not open this enclosure.

This symbol, on an RJ-45 receptacle, indicates a network interface connection.

WARNING: To reduce the risk of electric shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.

This symbol indicates the presence of a hot surface or hot component. If this surface is contacted, the potential for injury exists.

WARNING: To reduce the risk of injury from a hot component, allow the surface to cool before touching it.

These symbols, on power supplies or systems, indicate that the equipment is supplied by multiple sources of power.

WARNING: To reduce the risk of injury from electric shock, remove all power cords to completely disconnect power from the system.

This symbol indicates that the component exceeds the recommended weight for one individual to safely handle.

Weight in kg
Weight in lb

WARNING: To reduce the risk of personal injury or damage to the equipment, observe local occupational health and safety requirements and guidelines for manual material handling.

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Preparation Procedures

WARNING: Only authorized technicians trained by Compaq should attempt to repair this equipment. Because of the complexity of the individual boards and subassemblies, no one should attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs can create a safety hazard.

CAUTION: Electrostatic discharge (ESD) can damage electronic components. Be sure that you are properly grounded (earthed) before beginning any installation procedure. See "Electrostatic Discharge Information" earlier in this chapter for more information.

Powering Down the Server

Before beginning any removal and replacement procedure:

1. Open the drive bay door on the front bezel.
2. Power down the ProLiant ML330e/ML330 server by pressing the power button on the front of the server.

IMPORTANT: To completely remove all power from the ProLiant ML330e/ML330 server, you must disconnect the power cord. The front panel power button may not completely shut down power to the server.

3. Disconnect and remove the AC power cord from the AC outlet, and then from the ProLiant ML330e/ML330 server.
4. Disconnect any other external equipment connections to the server.

Server Warnings and Precautions

WARNING: To reduce the risk of injury from electric shock, disconnect all power cords to completely remove power from the system.

WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching them.

CAUTION: Protect the server from power fluctuations and temporary interruptions with a regulating uninterruptible power supply (UPS). This device protects the hardware from damage caused by power surges and voltage spikes, and keeps the system in operation during a power failure.

CAUTION: The ProLiant ML330e/ML330 server must always be operated with system unit covers on. Proper cooling is not achieved when the system unit covers are removed.

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Front Bezel

WARNING: To reduce the risk of personal injury and to prevent damage to the equipment, before removing the front bezel, make sure that the server is powered down, all cables are disconnected from the back of the server, and the power cord is disconnected from the grounded (earthed) AC outlet.

To remove the front bezel:

1. Complete the preparation procedures. See "Preparation Procedures" earlier in this chapter.
2. Pull forward on the latch at the bottom of the front bezel ❶.
3. Swing the front bezel upward, and then slide it out and away from the chassis ❷.

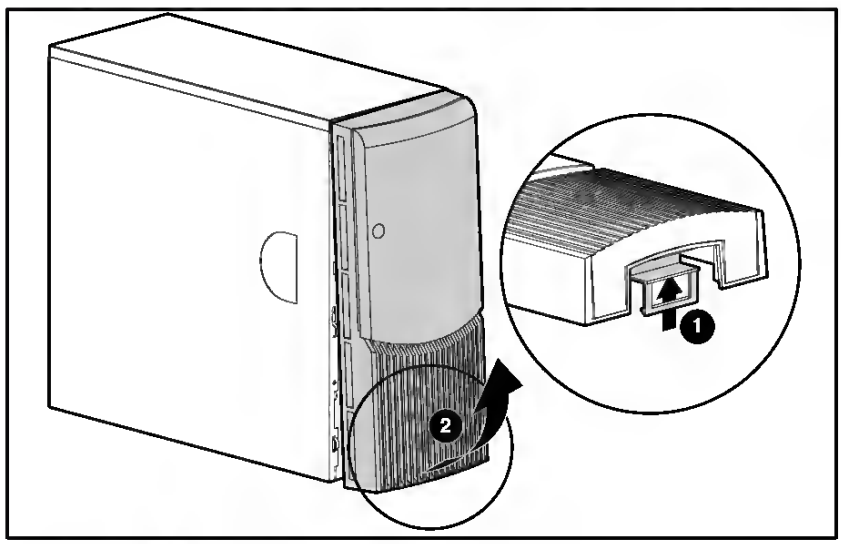

Figure 2-1. Removing the front bezel

NOTE: When replacing the front bezel, ensure that the top hinge points are properly placed in the chassis before rotating the front bezel back into its original position.

NOTE: Intruder Alert enables and disables the intruder alert option. When enabled, an intruder alert message is displayed if the front bezel has been unlatched or removed. The default setting is disabled.

To replace the front bezel, reverse steps 2 and 3.

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Access Panel

WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching them.

WARNING: To reduce the risk of personal injury and to prevent damage to the equipment, before removing the access panel, make sure that the server is powered down, all cables are disconnected from the back of the server, and the power cord is disconnected from the grounded (earthed) AC outlet.

CAUTION: Do not operate the server while the large access panel is removed. This panel is an integral part of the cooling system, and removing the panel while the system is running may adversely affect data integrity.

To remove the access panel:

1. Perform the preparation procedures. See "Preparation Procedures" earlier in this chapter.
2. Remove the front bezel. See "Front Bezel" earlier in this chapter.
3. Remove the screw located on the left side of the front chassis ❶.
4. Slide the access panel forward, pull from the top of the access panel, and then lift the panel from the chassis ❷.

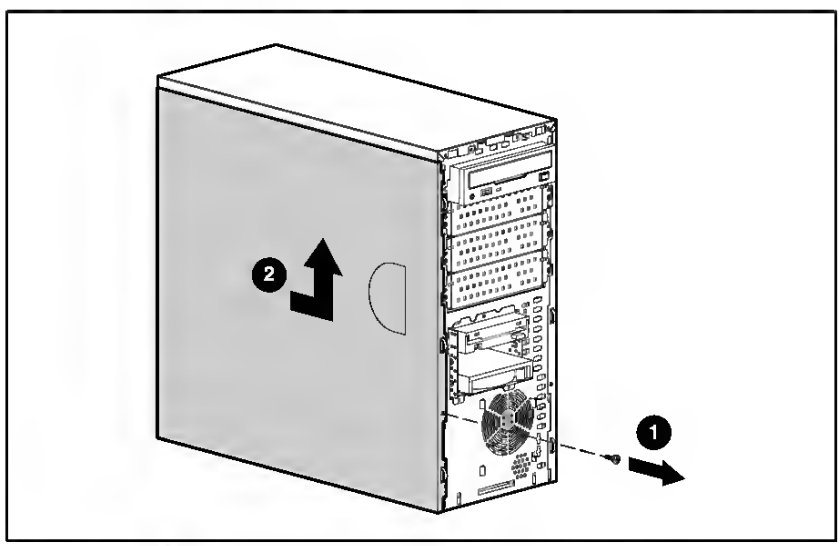

Figure 2-2. Removing the access panel

NOTE: Turn the access panel over to locate the System Configuration Label. This label provides information about the system board on your ProLiant ML330e/ML330 server.

To replace the access panel, reverse steps 2 through 4.

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Storage Devices

The ProLiant ML330e/ML330 server ships standard with seven drive bays, five of which are available. Figure 2-3 shows the location of the storage devices. Table 2-1 shows the corresponding drive bay descriptions.

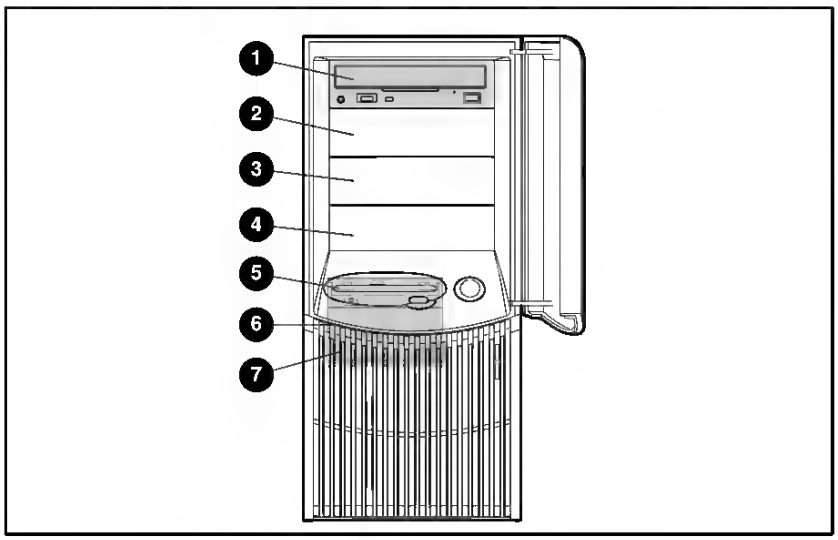

Figure 2-3. Storage device drive bay locations

Table 2-1
Storage Device Drive Bay Descriptions

Drive Position	Description
❶	5.25-inch x 1.6-inch IDE CD-ROM drive bay
❷	5.25-inch x 1.6-inch available removable media drive bay
❸	5.25-inch x 1.6-inch available removable media drive bay
❹	5.25-inch x 1.6-inch available removable media drive bay
❺	3.5-inch x 1-inch 1.44-MB diskette drive bay
❻	3.5-inch x 1-inch hard drive bay
❼	3.5-inch x 1-inch hard drive bay

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Bezel Blanks

To remove a bezel blank from the front bezel:

WARNING: To reduce the risk of personal injury and to prevent damage to the equipment, before removing the front bezel, make sure that the server is powered down, all cables are disconnected from the back of the server, and the power cord is disconnected from the grounded AC outlet.

1. Remove the front bezel. See "Front Bezel" earlier in this chapter.
2. On the back of the front bezel, pinch the tabs on either end of the bezel blank toward each other ❶, and then push the bezel blank through the front bezel ❷.

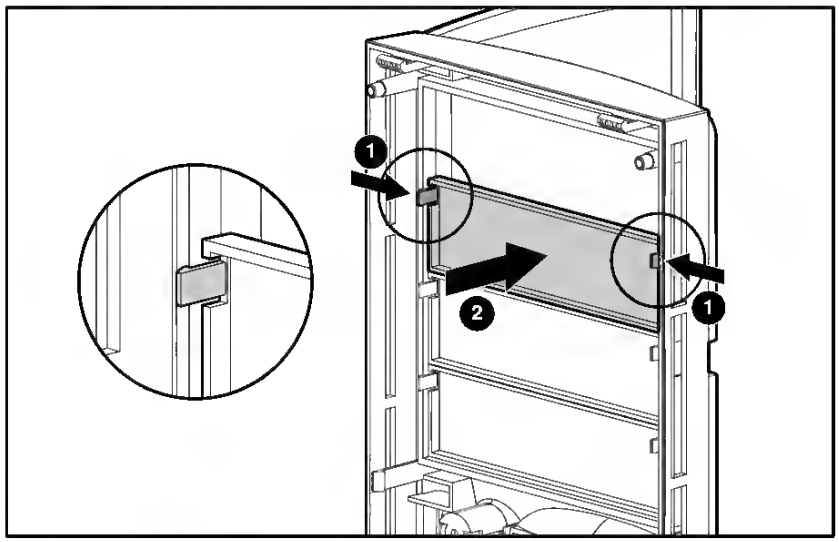

Figure 2-4. Removing a bezel blank

To replace a bezel blank, reverse steps 1 and 2.

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Drive Tray

To remove a drive tray from a removable media bay:

WARNING: To reduce the risk of personal injury and to prevent damage to the equipment, before removing the access panel, make sure that the server is powered down, all cables are disconnected from the back of the server, and the power cord is disconnected from the grounded (earthed) AC outlet.

NOTE: The drive trays in the removable media bays can be used to mount internal 3.5-inch hard drives.

1. Complete the preparation procedures. See "Preparation Procedures" earlier in this chapter.
2. Remove the front bezel. See "Front Bezel" earlier in this chapter.
3. Remove the access panel. See "Access Panel" earlier in this chapter.
4. Remove the screws on either side of the drive tray ❶, and then gently slide the drive tray out of the front of the chassis ❷.

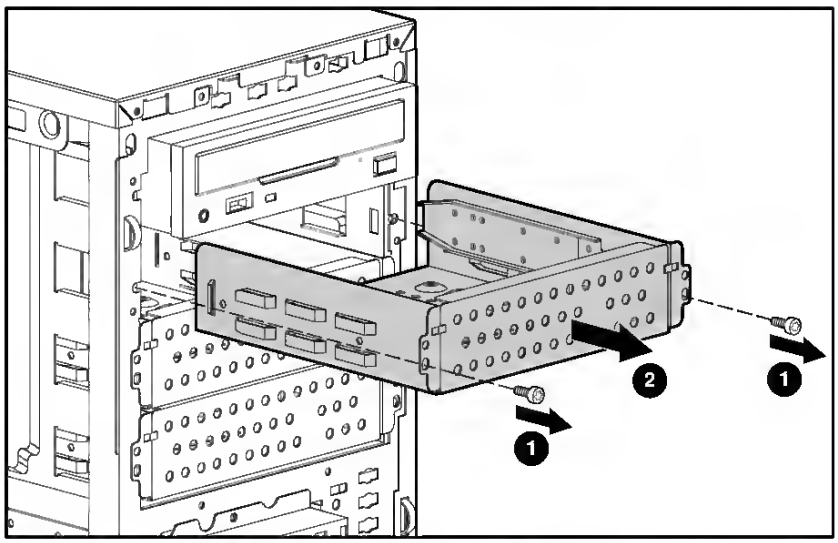

Figure 2-5. Removing a drive tray

To replace a drive tray, reverse steps 2 through 4.

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ATA Hard Drive Compartment (ProLiant ML330e Server)

To remove an ATA hard drive compartment from the ProLiant ML330e server:

1. Complete the preparation procedures. See "Preparation Procedures" earlier in this chapter.
2. Remove the front bezel door. See "Front Bezel" earlier in this chapter.
3. Remove the access panel. See "Access Panel" earlier in this chapter.
4. Disconnect all power and data cables from the back of all drives mounted in the hard drive compartment being removed.

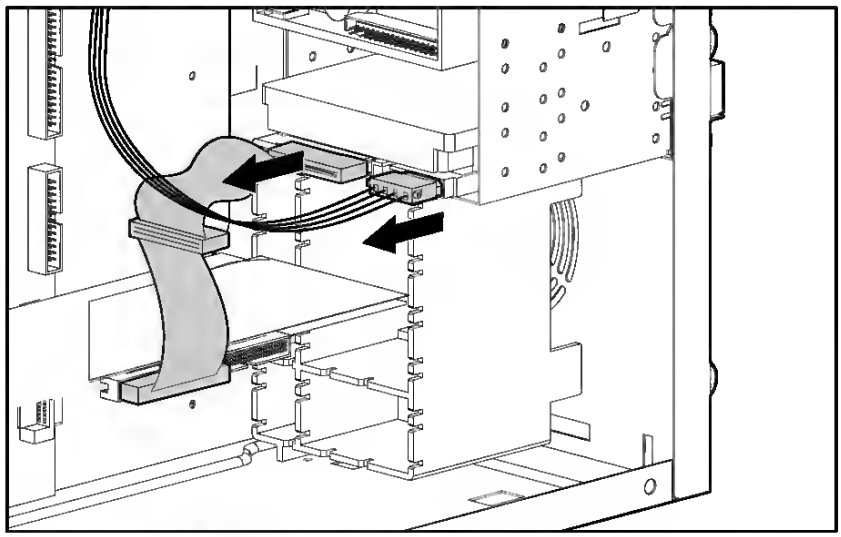

Figure 2-6. Disconnecting power and data cables from the ATA hard drive compartment

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5. Remove the three shipping screws ❶, squeeze the two spring clips ❷, and then pull the drive compartment from the chassis ❸.

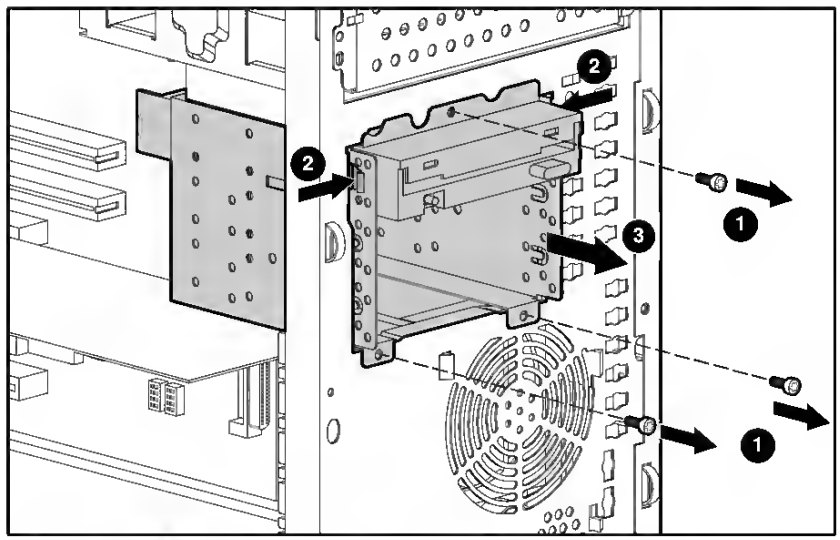

Figure 2-7. Removing an ATA hard drive compartment

To replace an ATA hard drive compartment, reverse steps 2 through 5.

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SCSI Hard Drive Compartment (ProLiant ML330 Server)

To remove a SCSI hard drive compartment from the ProLiant ML330 server:

1. Complete the preparation procedures. See "Preparation Procedures" earlier in this chapter.
2. Remove the front bezel door. See "Front Bezel" earlier in this chapter.
3. Remove the access panel. See "Access Panel" earlier in this chapter.
4. Disconnect all power and data cables from the back of all drives mounted in the hard drive compartment being removed.

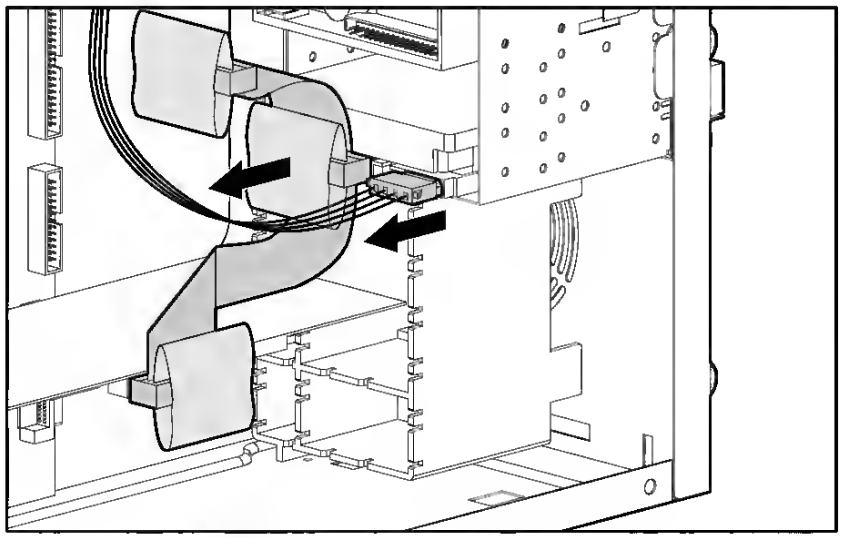

Figure 2-8. Disconnecting power and data cables from the SCSI hard drive compartment

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5. Remove the three shipping screws ❶, squeeze the two spring clips ❷, and then pull the drive compartment from the chassis ❸.

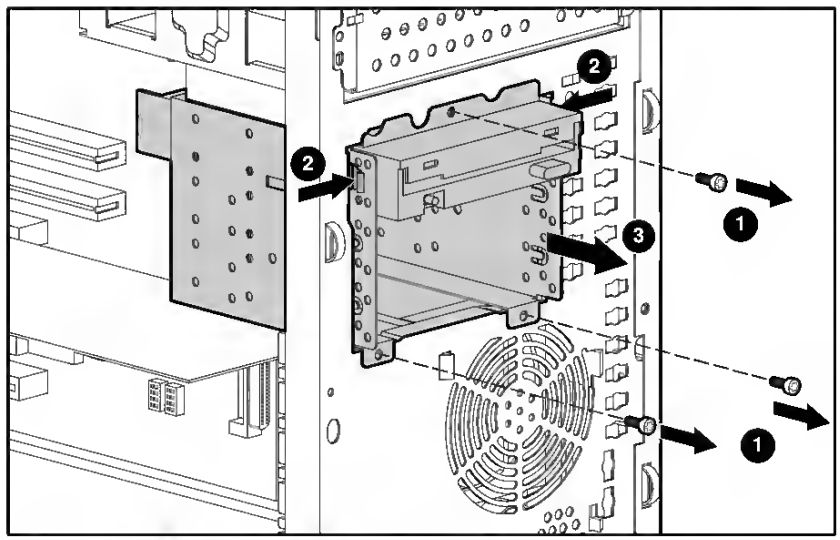

Figure 2-9. Removing a SCSI hard drive compartment

To replace a SCSI hard drive compartment, reverse steps 2 through 5.

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Hard Drives

To remove a hard drive from the hard drive compartment:

1. Complete the preparation procedures. See "Preparation Procedures" earlier in this chapter.
2. Remove the front bezel. See "Front Bezel" earlier in this chapter.
3. Remove the access panel. See "Access Panel" earlier in this chapter.
4. Disconnect all the power and data cables from the back of all drives on the bard drive compartment.
5. Remove the two screws on each side of the drive ❶.
6. Gently slide the drive out from the front of the hard drive compartment ❷.

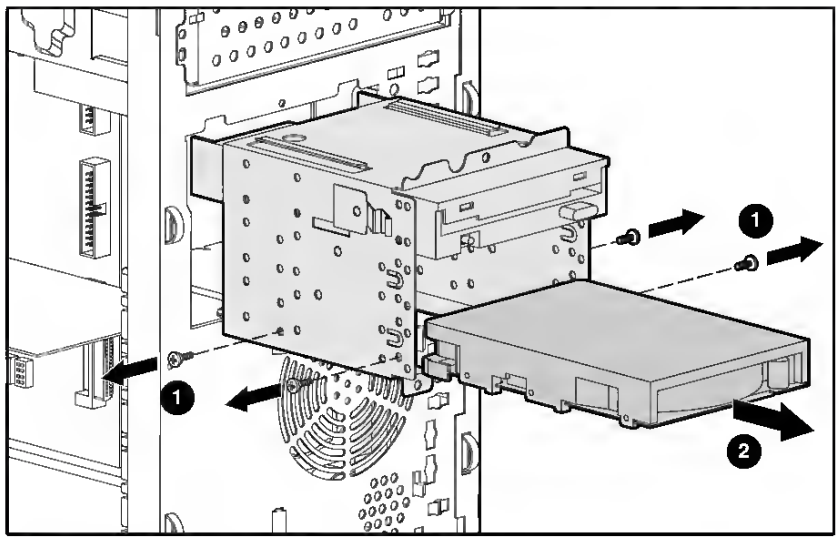

Figure 2-10. Removing a hard drive

To replace the hard drive, reverse steps 2 through 6.

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Power Switch

IMPORTANT: To completely remove all power from the system, you must disconnect the power cord from the server.

To remove the power switch:

1. Complete the preparation procedures. See "Preparation Procedures" earlier in this chapter.
2. Remove the front bezel. See "Front Bezel" earlier in this chapter.
3. Remove the access panel. See "Access Panel" earlier in this chapter.
4. Disconnect the power switch cable from the system board.

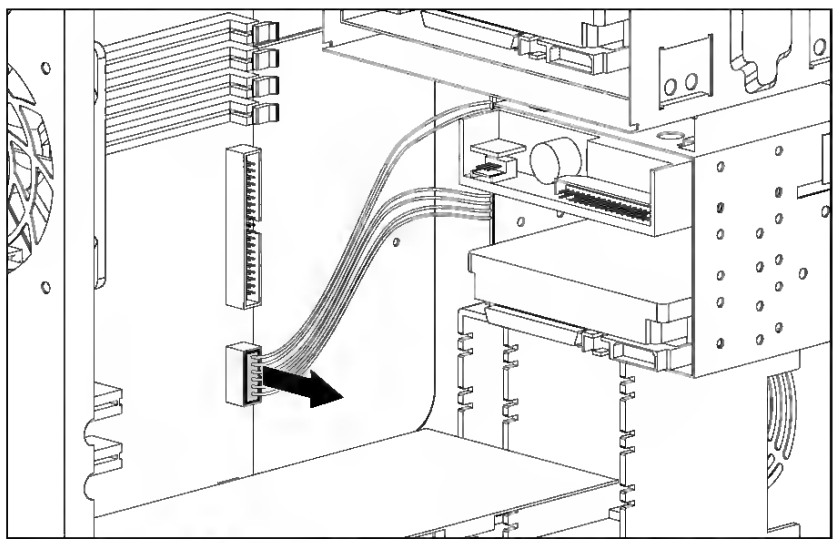

Figure 2-11. Disconnecting the power switch cable from the system board

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5. From the front of the chassis, squeeze the sides of the power switch to disengage the two retainer clips from the chassis ❶, and then gently remove the power switch from the chassis ❷.
6. Also from the front of the chassis, squeeze the side of the LED to disengage the two retainer clips from the chassis ❸, and then gently remove the LED from the chassis ❹.

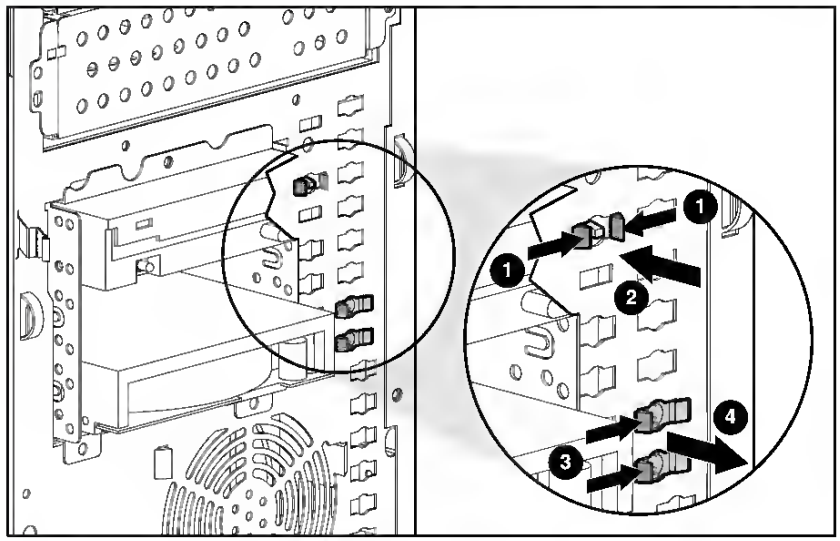

Figure 2-12. Removing the power switch and LED

To replace the power switch and LED, reverse steps 2 through 6.

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Fan

To remove the fan:

1. Complete the preparation procedures. See "Preparation Procedures" earlier in this chapter.
2. Remove the front bezel. See "Front Bezel" earlier in this chapter.
3. Remove the access panel. See "Access Panel" earlier in this chapter.
4. Disconnect the fan power cable from the system board fan connector ❶.
5. Use a Phillips screwdriver to remove the four mounting screws from the rear of the server ❷.
6. Pull the fan out and away from the chassis ❸.

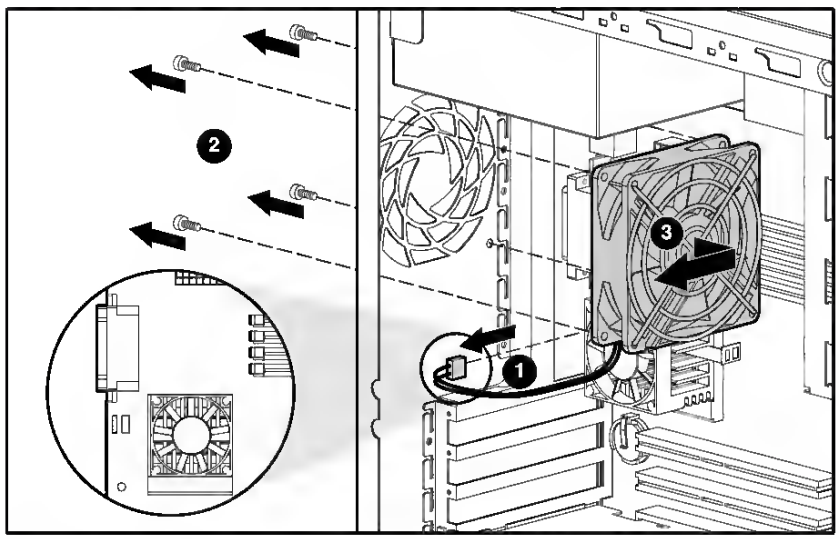

Figure 2-13. Removing the fan

To replace the fan, reverse steps 2 through 6.

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Cable Routing Diagrams

Figure 2-14 through Figure 2-18 show cable routing diagrams for the ProLiant ML330e/ML330 server.

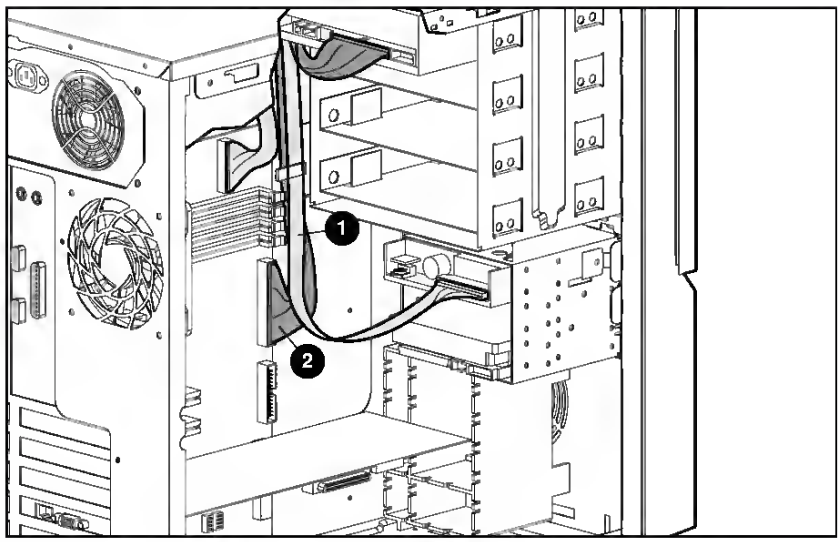

Figure 2-14. Diskette drive cable and IDE CD-ROM drive cable routing

Table 2-2
Diskette Drive Cable and IDE CD-ROM Drive Cable Routing

Item	Description
❶	Diskette drive cable
❷	IDE CD-ROM drive cable

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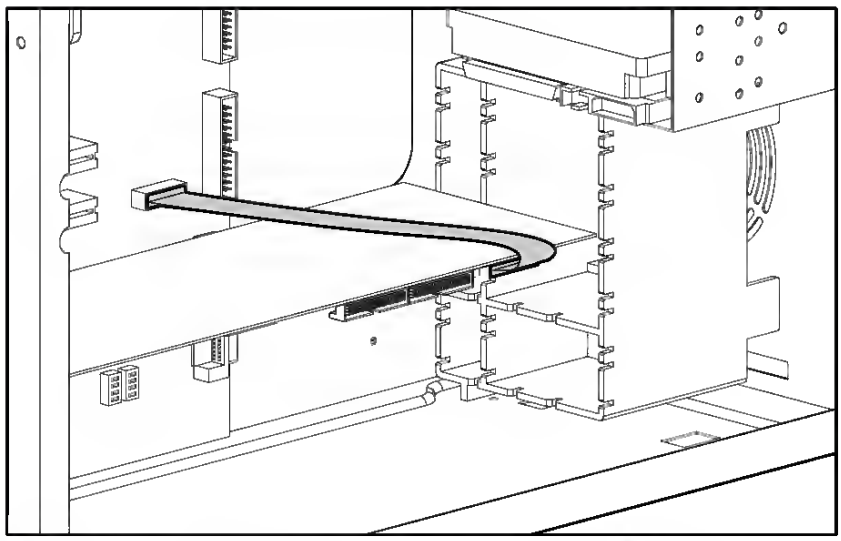

Figure 2-15. Server Management Information Cable (SMIC) routing (ProLiant ML330e server)

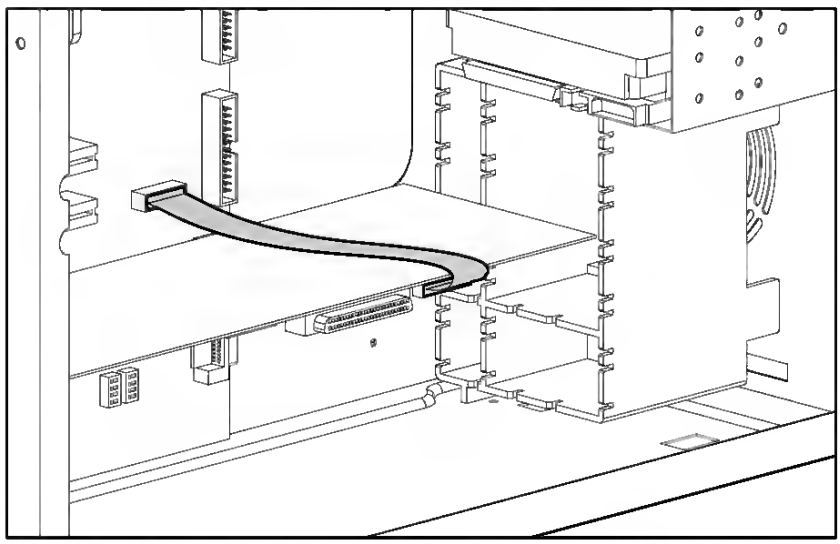

Figure 2-16. Server Management Information Cable (SMIC) routing (ProLiant ML330 server)

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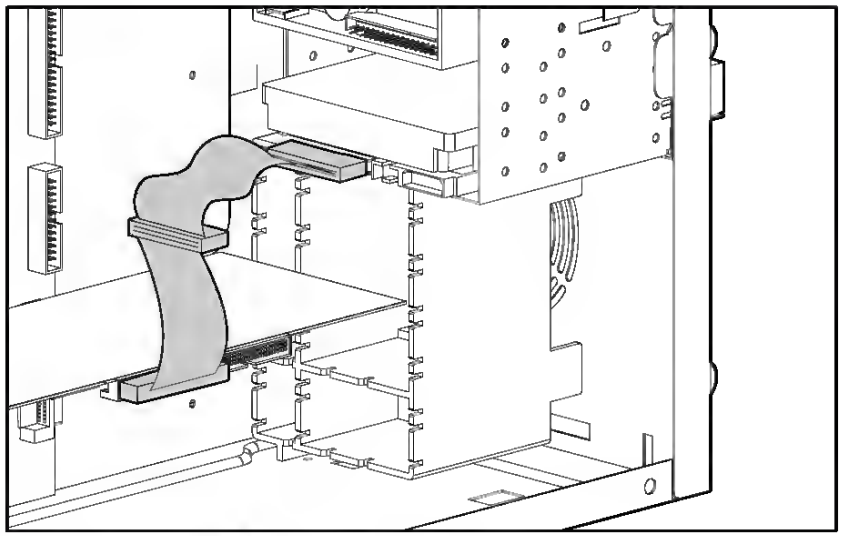

Figure 2-17. ATA cable routing (ProLiant ML330e server)

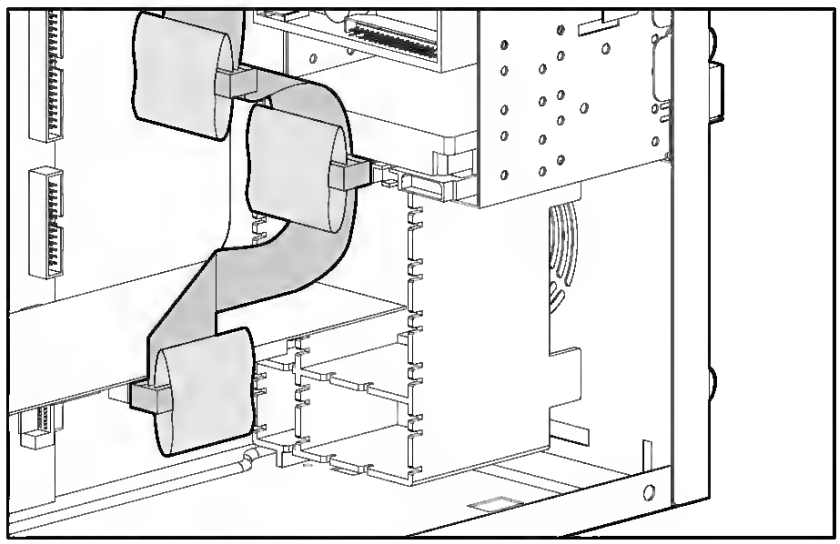

Figure 2-18. Integrated Wide Ultra2 SCSI cable routing (ProLiant ML330 server)

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Processor with Heatsink

To remove a processor with heatsink:

CAUTION: Electrostatic discharge (ESD) can damage electronic components. Be sure that you are properly grounded (earthed) before beginning any installation procedure. See "Electrostatic Discharge Information" earlier in this chapter for more information.

WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching them.

1. Complete the preparation procedures. See "Preparation Procedures" earlier in this chapter.
2. Remove the front bezel. See "Front Bezel" earlier in this chapter.
3. Remove the access panel. See "Access Panel" earlier in this chapter.
4. Unplug the processor fan from the system board.

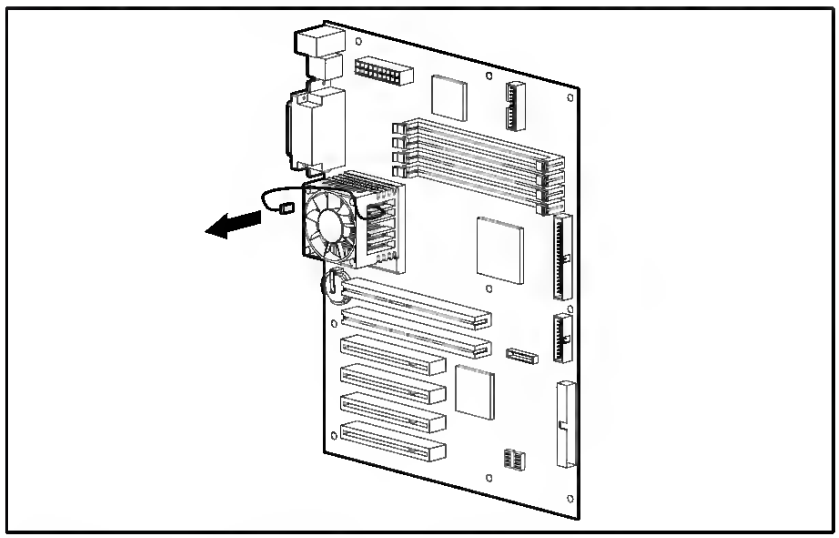

Figure 2-19. Unplugging the processor fan from the system board

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5. Press down and release the heatsink retainer clip to disengage one side from the processor socket ❶.
6. Unhook the opposite side of the heatsink retainer clip from the processor socket ❷, and then lift the heatsink/fan assembly from the processor socket ❸.
7. Lift the lever, located on the side of the processor socket, to release the pins of the processor ❹, and then pull the processor from the socket ❺.

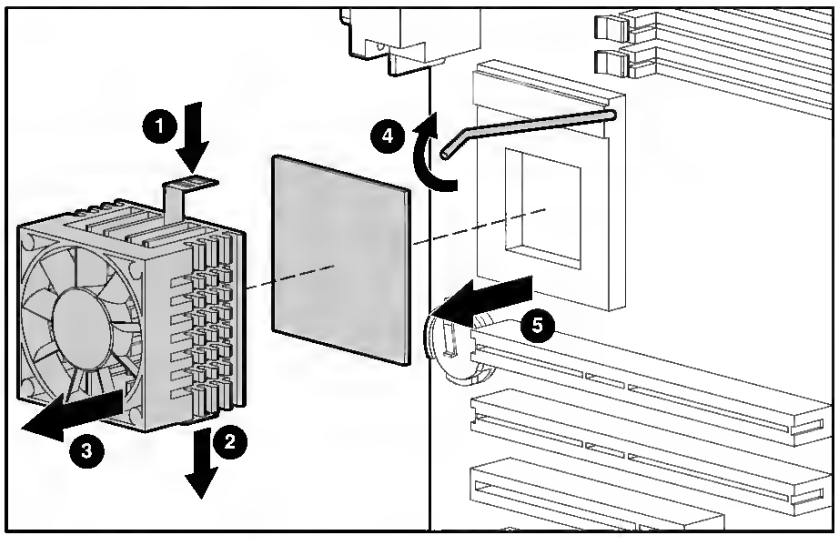

Figure 2-20. Removing the processor with heatsink

To replace the processor with heatsink, reverse steps 2 through 7.

IMPORTANT: The processor is keyed to ensure correct alignment.

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Memory Modules

The ProLiant ML330e/ML330 server supports 64-, 128-, 256-, or 512-MB PC 133-MHz Registered error checking and correcting (ECC) synchronous dynamic random access memory (SDRAM) dual inline memory modules (DIMMs).

CAUTION: Electrostatic discharge (ESD) can damage electronic components. Be sure that you are properly grounded (earthed) before beginning any installation procedure. See "Electrostatic Discharge Information" earlier in this chapter for more information.

CAUTION: When handling a memory module, be careful not to touch any of the contacts Doing so may damage the module.

The following guidelines must be followed when installing or replacing memory:

- Use only 64-, 128-, 256-, or 512-MB PC 133-MHz Registered ECC SDRAM DIMMs.
- Memory modules must be industry-standard, 168-pin, PC 133-MHz Registered SDRAM DIMMs. The SDRAM DIMMs must support CAS Latency 3 (CL=3).
- Do not mix ECC and non-ECC SDRAM DIMMs. If different types of memory modules are mixed, the system does not properly function.

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NOTE: Memory modules do not need to be installed in pairs and can be installed in any available socket.

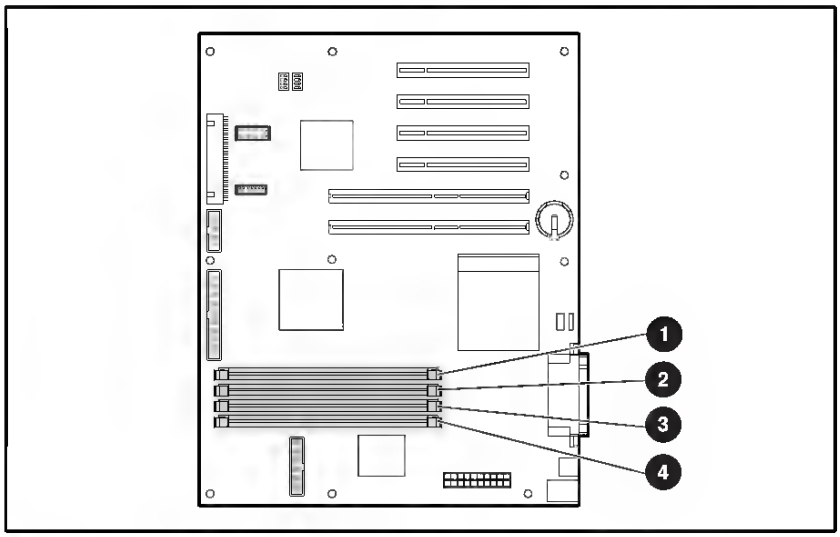

Figure 2-21. Memory module socket locations

Table 2-3
Memory Module Socket Locations

Item	Description
❶	Socket 1
❷	Socket 2
❸	Socket 3
❹	Socket 4

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Removing a Memory Module

To remove a memory module:

1. Complete the preparation procedures. See "Preparation Procedures" earlier in this chapter.
2. Remove the front bezel. See "Front Bezel" earlier in this chapter.
3. Remove the access panel. See "Access Panel" earlier in this chapter.
4. Press outward on both latches of the memory module socket at the same time ❶. This step releases the DIMM and pushes it partially out of the socket.
5. Lift the memory module from the socket ❷.

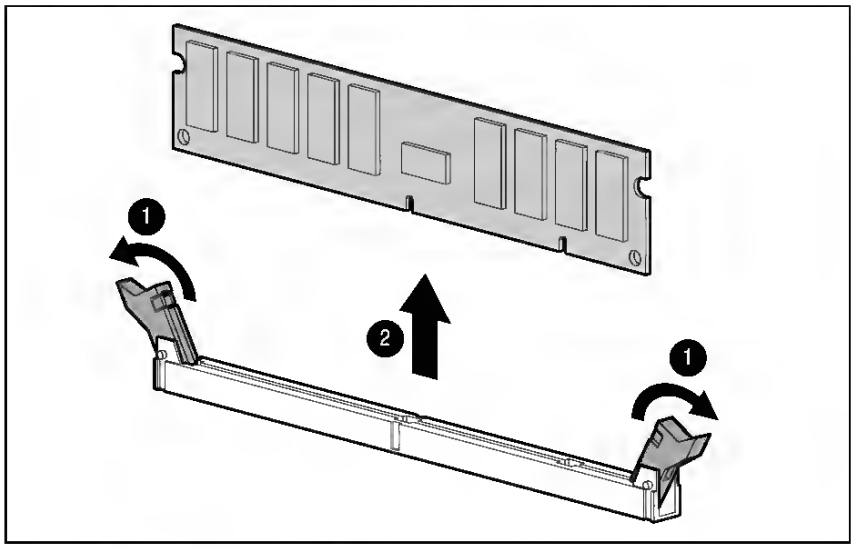

Figure 2-22. Removing a memory module

To replace a memory module, reverse steps 2 through 5.

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Expansion Slots

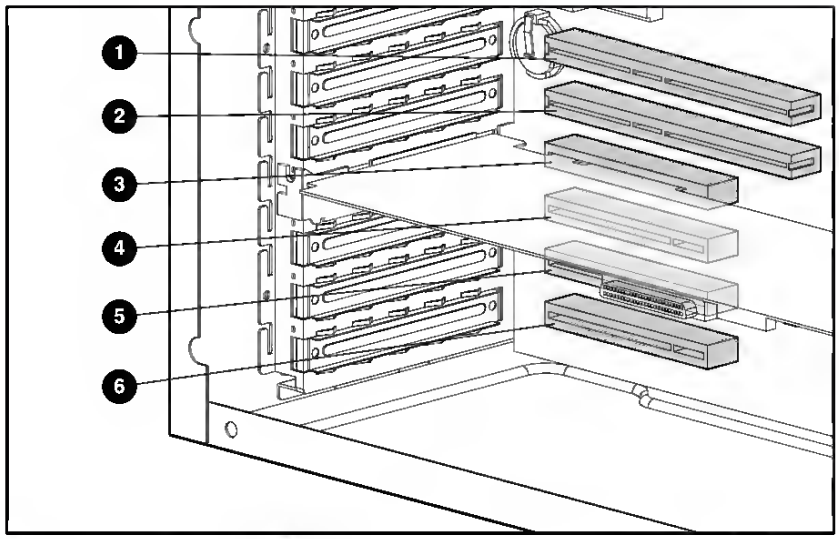

Figure 2-23. Expansion slot locations

Table 2-4
Expansion Slots

Item	Description	Slot Number
❶	64-bit PCI (half-length)	1
❷	64-bit PCI	2
❸	32-bit PCI (Server Feature Board)	3
❹	32-bit PCI	4
❺	32-bit PCI	5
❻	32-bit PCI	6

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Server Feature Board

To remove a Server Feature Board:

1. Complete the preparation procedures. See "Preparation Procedures" earlier in this chapter.
2. Remove the front bezel. See "Front Bezel" earlier in this chapter.
3. Remove the access panel. See "Access Panel" earlier in this chapter.
4. Disconnect any cables connected to the Server Feature Board.
5. Remove the screw securing the Server Feature Board to the chassis ❶, and then pull the Server Feature Board out of the server ❷.

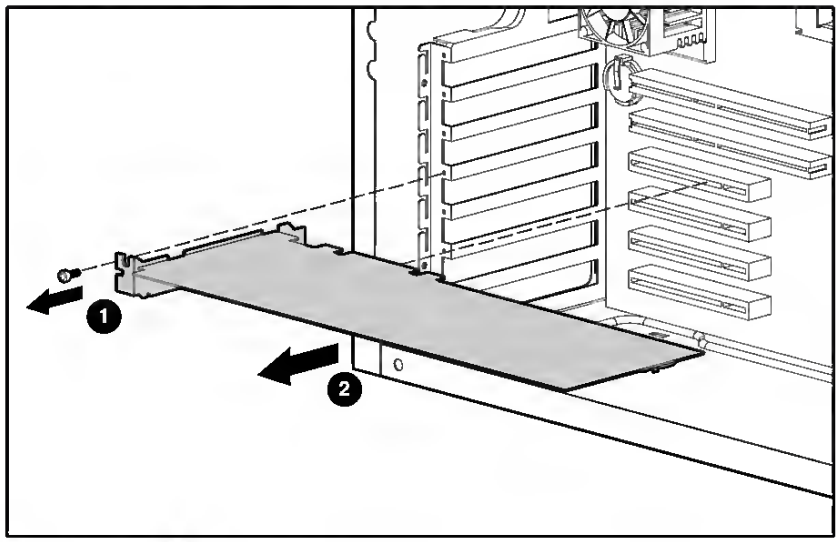

Figure 2-24. Removing the Server Feature Board

NOTE: The Server Feature Board is located only in slot 3.

To replace the Server Feature Board, reverse steps 2 through 5.

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Expansion Board Guide

To remove the expansion board guide:

1. Complete the preparation procedures. See "Preparation Procedures" earlier in this chapter.
2. Remove the front bezel. See "Front Bezel" earlier in this chapter.
3. Remove the access panel. See "Access Panel" earlier in this chapter.
4. Remove all expansion boards supported by the board guide.
5. Push in the four locking tabs ❶, and then pull the guide back and away from the chassis ❷.

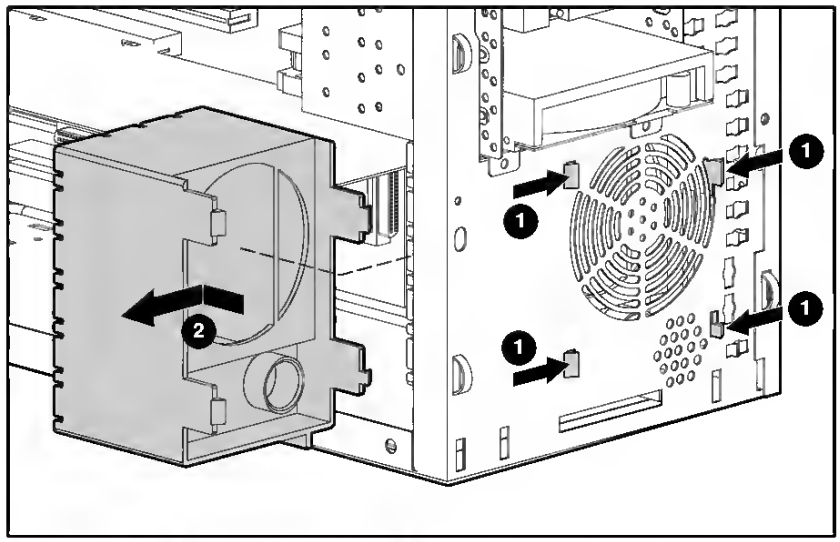

Figure 2-25. Removing the expansion board guide

To replace the expansion board guide, reverse steps 2 through 5.

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System Board

> **CAUTION:** Electrostatic discharge (ESD) can damage electronic components. Be sure that you are properly grounded (earthed) before beginning any installation procedure. See "Electrostatic Discharge Information" earlier in this chapter for more information.

To remove the system board:

1. Complete the preparation procedures. See "Preparation Procedures" earlier in this chapter.
2. Remove the front bezel. See "Front Bezel" earlier in this chapter.
3. Remove the access panel. See "Access Panel" earlier in this chapter.
4. Remove all expansion boards seated on the system board.
5. Disconnect all cables from the system board.
6. Remove the ten screws securing the system board to the chassis ❶.
7. Pull the system board out of the chassis ❷.

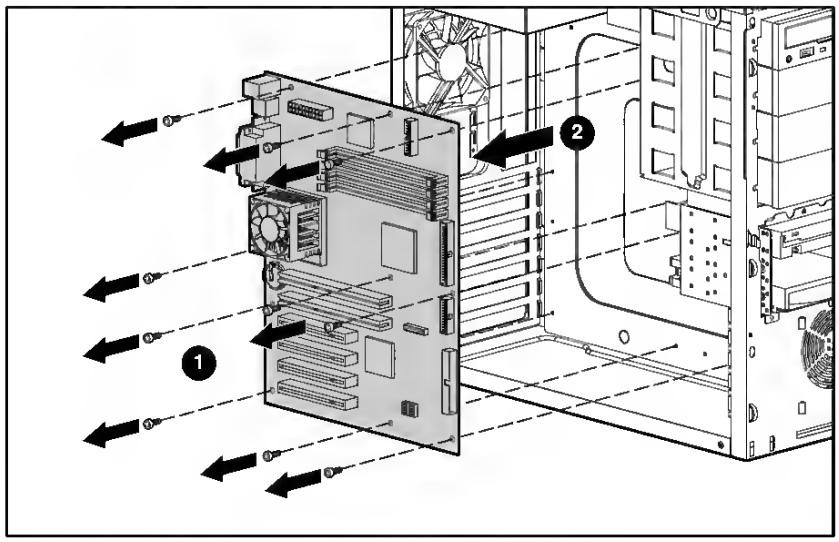

Figure 2-26. Removing the system board

To replace the system board, reverse steps 2 through 7.

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Power Supply

To remove the power supply:

WARNING: To reduce the risk of electric shock or damage to the equipment:

- Unplug the power cord before removing the power supply from the server.
- Install the power supply before connecting the power cord to the power supply.

CAUTION: To avoid dropping the power supply, pull out and hold the power supply with a firm grip.

1. Complete the preparation procedures. See "Preparation Procedures" earlier in this chapter.
2. Remove the front bezel. See "Front Bezel" earlier in this chapter.
3. Remove the access panel. See "Access Panel" earlier in this chapter.
4. Remove the four screws securing the power supply to the rear of the chassis ❶.
5. Slide the power supply forward, and then lift the power supply from the chassis ❷.

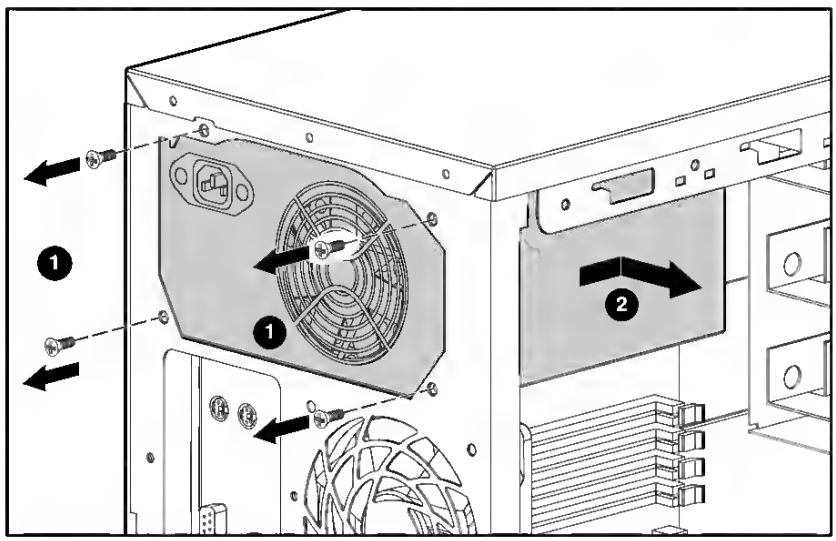

Figure 2-27. Removing the power supply

To replace the power supply, reverse steps 2 through 5.

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Replacing a Battery

The ProLiant ML330e/ML330 server has nonvolatile memory, which requires a battery to retain system information. There is a battery on the system board and a battery on the Server Feature Board. These batteries are required to maintain certain system data.

Replacing the System Board Battery

If your server no longer automatically displays the correct date and time, you may need to replace the battery that provides power to the real-time clock. When replacing a battery, use a 3-volt CR2032 lithium coin cell battery.

WARNING: The system board contains a lithium battery. There is a risk of fire and chemical burn if the battery is improperly handled. Do not disassemble, crush, puncture, or short external contacts, dispose of in water or fire, or expose the battery to temperatures higher than 60°C (140°F).

CAUTION: Electrostatic discharge (ESD) can damage electronic components. Be sure that you are properly grounded (earthed) before beginning any installation procedure. See "Electrostatic Discharge Information" earlier in this chapter for more information.

To replace the lithium coin cell battery from the system board:

1. Complete the preparation procedures. See "Preparation Procedures" earlier in this chapter.
2. Remove the front bezel. See "Front Bezel" earlier in this chapter.
3. Remove the access panel. See "Access Panel" earlier in this chapter.

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4. Locate the battery on the system board, and then slide the battery out of the holder.
5. Slide the replacement battery into the proper position with the positive (+) side up.

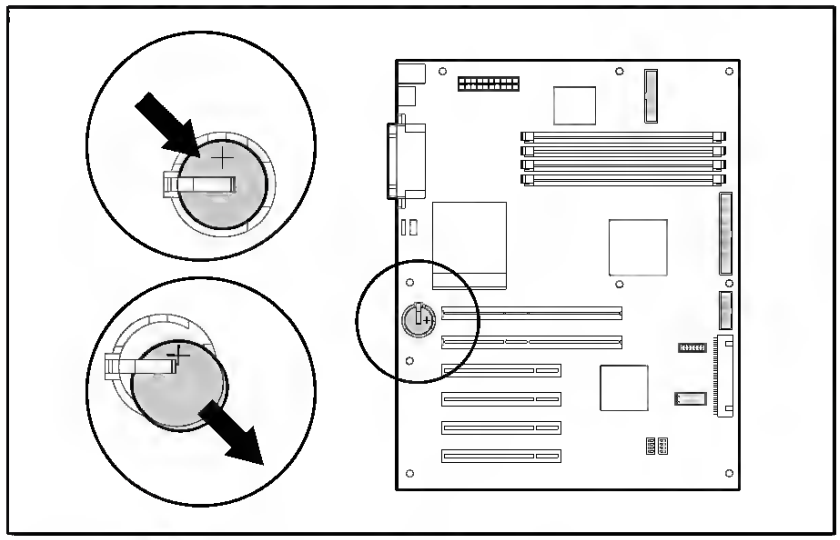

Figure 2-28. Locating and removing the battery from the system board

IMPORTANT: Positive (+) polarity must be positioned up.

6. For the ProLiant ML330 server, run the BIOS Setup utility to reconfigure your system.
7. For the ProLiant ML330e server, run the ROM Based Setup Utility (RBSU) to reconfigure your system.

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Replacing the Server Feature Board Battery

WARNING: The Server Feature Board contains a lithium battery. There is a risk of fire and chemical burn if the battery is improperly handled. Do not disassemble, crush, puncture, or short external contacts, dispose of in water or fire, or expose the battery to temperatures higher than 60°C (140°F).

CAUTION: Electrostatic discharge (ESD) can damage electronic components. Be sure that you are properly grounded (earthed) before beginning any installation procedure. See "Electrostatic Discharge Information" earlier in this chapter for more information.

To replace the lithium coin cell battery from the Server Feature Board:

1. Complete the preparation procedures. See "Preparation Procedures" earlier in this chapter.
2. Remove the front bezel. See "Front Bezel" earlier in this chapter.
3. Remove the access panel. See "Access Panel" earlier in this chapter.
4. Remove the Server Feature Board. See "Server Feature Board" earlier in this chapter.
5. Locate the battery on the Server Feature Board, and then slide the battery out of the holder.
6. Slide the replacement battery into the proper position with the positive (+) side up.

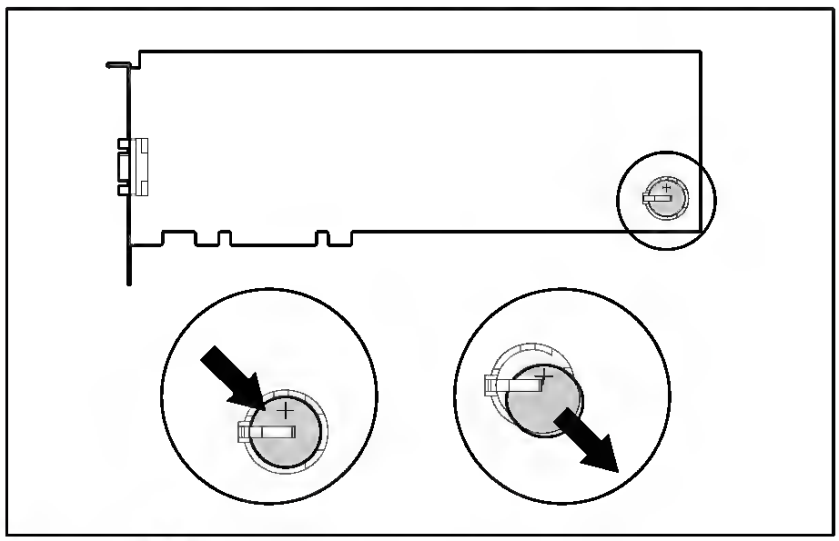

Figure 2-29. Locating and removing the battery from the Server Feature Board

IMPORTANT: Positive (+) polarity must be positioned up.

7. Replace the Server Feature Board, front panel, and bezel.
8. Connect the server and power up.
9. For the ProLiant ML330 server, run the BIOS Setup utility to reconfigure your system.
10. For the ProLiant ML330e server, run the RBSU to reconfigure your system.

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Chapter 3

Diagnostics Tools

This chapter provides an overview of the software and firmware diagnostics tools available for the Compaq ProLiant ML330e/ML330 server.

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Diagnostics Tools Utility Overview

The following utilities were developed to assist in diagnosing problems, testing the hardware, and monitoring and managing the ProLiant ML330e/ML330 server hardware.

Table 3-1
Diagnostics Tools

Tool	What it is	How to run it
Compaq Diagnostics	Utility to assist testing and/or verifying operation of Compaq hardware. If problems are found, Compaq Diagnostics isolates failures down to the replaceable part whenever possible.	Diagnostics and utilities must be accessed when a system configuration error is detected during Power-On Self-Test (POST). For a complete list of POST error messages, see the *Compaq Servers Troubleshooting Guide*. Compaq Diagnostics software is also available on the Compaq SmartStart and Support Software CD. A Diagnostics diskette can be created from the SmartStart and Support Software CD, and Diagnostics can then be run from the diskette.
Compaq Inspect Utility	The Inspect Utility provides a report detailing system inventory and configuration information.	Run the Inspect Utility from the Compaq Diagnostics program.
Compaq Insight Manager™	A client/server application used to remotely manage Compaq systems in a network environment. Reports hardware fault conditions (both failure and prefailure) and collects data for reporting and graphing.	For more information, refer to the Compaq Management CD and the *Compaq Insight Manager User Guide*.
Compaq Survey Utility	An information-gathering program that runs on servers, gathering critical hardware and software information from various sources. A utility for servers running Microsoft Windows NT or Novell NetWare. If a significant change occurs between data-gathering intervals, previous information is marked, and the survey text file is overwritten to reflect the latest configuration and changes since the last configuration. This utility provides a historical record of change events for server hardware and software.	Install the Survey Utility from SmartStart, the Compaq Integration Maintenance Utility, or the Compaq Management CD.

continued

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Table 3-1
Diagnostics Tools *continued*

Tool	What it is	How to run it
Compaq SmartStart	Located on the SmartStart and Support Software CO, SmartStart is the intelligent way to set up your Compaq server. SmartStart includes the *ROMPaq*™ Utility, driver updates, and assisted operating system installations.	Power up from the SmartStart and Support Software CO.
Array Diagnostics Utility (AOU)	A Windows-based tool designed to run on all Compaq systems that support Compaq array controllers. The main functions of AOU are to collect all possible information about the array controllers in the system and to generate a list of detected problems.	Power up from the SmartStart and Support Software CO or use the Diskette Builder (also located on the CO) to create AOU bootable diskettes. Use the information provided in the AOU. For a complete list of AOU error messages, see the *Compaq Servers Troubleshooting Guide*.
Integrated Management Log	A log of system events, such as system failures or nonfatal error conditions. View events from within: ■ Compaq Insight Manager ■ Compaq Survey Utility ■ OS-specific IML Utilities	The IML requires Compaq operating system-dependent drivers. Refer to the Compaq Software Support CO for instructions on installing the appropriate drivers.
BIOS Setup utility for the ProLiant ML330 server	Utility used to configure the hardware installed in or connected to the server. Specifically, it can: ■ Configure PCI boards automatically ■ Manage installation of memory, processor upgrades, and mass storage devices such as hard drives, tape drives, and diskette drives ■ Store configuration information in nonvolatile memory ■ Assist in installation of an operating system	The BIOS Setup utility is loaded during POST if **F10** is pressed. When "F10-Setup" is displayed in the lower right corner of the screen, press **F10** to initiate the utility.

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Table 3-1
Diagnostics Tools *continued*

Tool	What it is	How to run it
ROM Based Setup Utility (RBSU) for the ProLiant ML330e server	Utility used to configure some hardware installed in or connected to the server. Specifically, it can: ■ Resolve resource conflicts in areas such as memory, port addresses, and interrupts (IRQs) ■ Configure PCI boards automatically ■ Provide switch and jumper settings ■ Manage installation of memory, processor upgrades, and mass storage devices such as hard drives, tape drives, and diskette drives ■ Store configuration information in nonvolatile memory ■ Configure the platform for an operating system	Run RBSU directly from the system ROM by pressing **F9** when prompted during POST to enter the utility.
Automatic Server Recovery (ASR)	A tool that lets the server restart automatically after a catastrophic operating system failure, including software errors, OS lockups, environmental abnormalities, and some hardware errors. Unattended recovery logs the error information to the FRONT BEZEL:REMOVING, WARNING, resets the server, and tries to restart the operating system.	This tool is a function of the hardware/software system through RBSU. Verify that this tool is enabled through RBSU. The systems management drive must be loaded to activate ASR.
ROMPaq Utility	A utility that upgrades the current system ROM.	Run from the ROMPaq diskette after powering up the system.
SmartStart Diskette Builder	Creates a diskette version of the utility from the SmartStart and Support Software CD.	Run from the SmartStart and Support Software CD.

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For More Information

For detailed information about each of these diagnostics tools, see the *Compaq Servers Troubleshooting Guide* on the documentation CD. For the most recent version of this guide, go to the Compaq website:

http //www.compaq.com

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Chapter 4

Connectors, Switches, and LED Indicators

This chapter contains illustrations and tables identifying connectors, switches, and LED locations on the rear panel, Server Feature Board, and system board for the Compaq ProLiant ML330e/ML330 server.

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Connectors

This section contains graphics and tables identifying connector locations on the system board, rear panel, and Server Feature Board for the Compaq ProLiant ML330e/ML330 server.

System Board Components

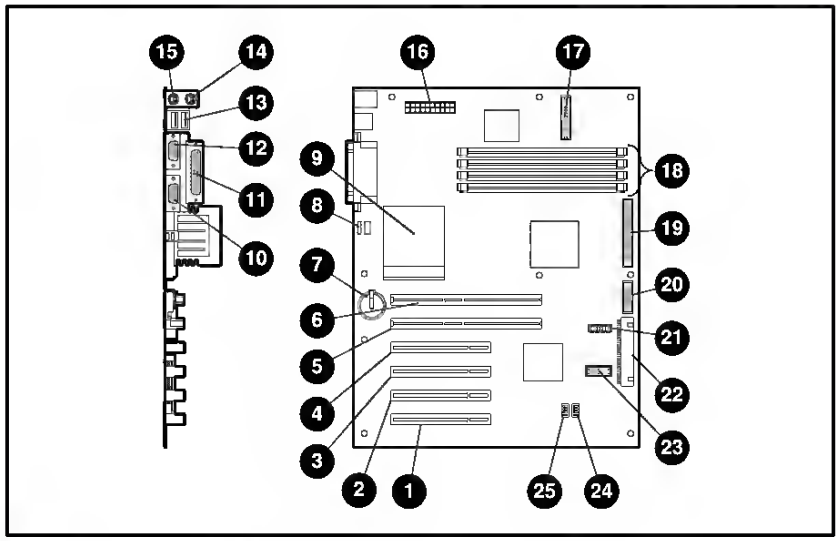

Figure 4-1. System board components

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Table 4-1
System Board Components

Item	Description	Item	Description
❶	32-bit PCI slot 6	⓮	Mouse connector
❷	32-bit PCI slot 5	⓯	Keyboard connector
❸	32-bit PCI slot 4	⓰	Power supply connector
❹	32-bit PCI slot 3 (Server Feature Board)	⓱	Diskette drive connector
❺	64-bit PCI slot 2	⓲	DIMM slots (four)
❻	64-bit PCI slot 1 (half-length)	⓳	Primary IDE connector
❼	Battery	⓴	Power button connector
❽	System fan connector	㉑	Server Management Information Cable (SMIC) connector
❾	Processor	㉒	Secondary IDE connector
❿	Serial port connector B	㉓	Remote Insight Lights-Out Edition board connector
⓫	Parallel port connector	㉔	System configuration switch (SW2)
⓬	Serial port connector A	㉕	Reserved processor switch (SW1)
⓭	USB ports (ProLiant ML330e server only)		

IMPORTANT: Power for the Remote Insight Lights-Out Edition board must come from the external power supply of the Remote Insight Lights-Out Edition board and not from the system board.

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Rear Panel Connectors

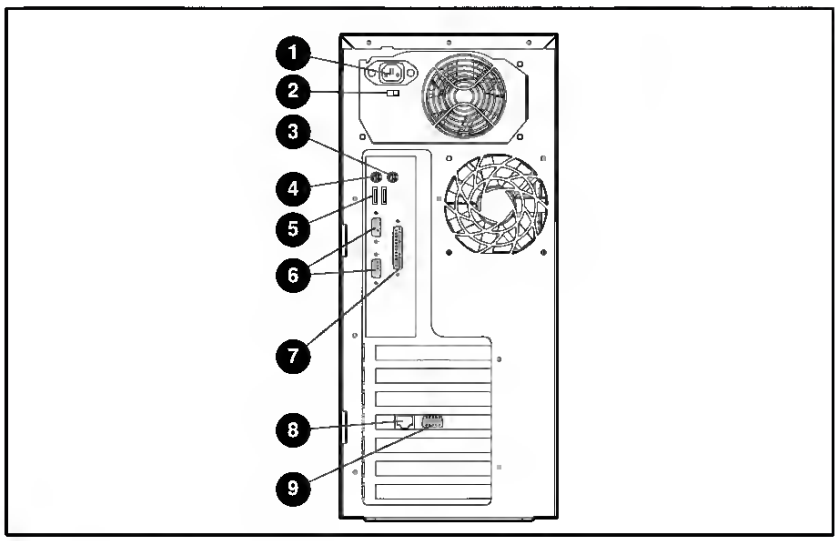

Figure 4-2. Rear panel connectors

Table 4-2
Rear Panel Connectors

Item	Description	Item	Description
❶	Power cord	❻	Serial ports
❷	Voltage selector switch	❼	Parallel port
❸	Mouse	❽	RJ-45 Ethernet for NIC
❹	Keyboard	❾	Video
❺	USB port (ProLiant ML330e server only)		

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Server Feature Board Components (ProLiant ML330e Server)

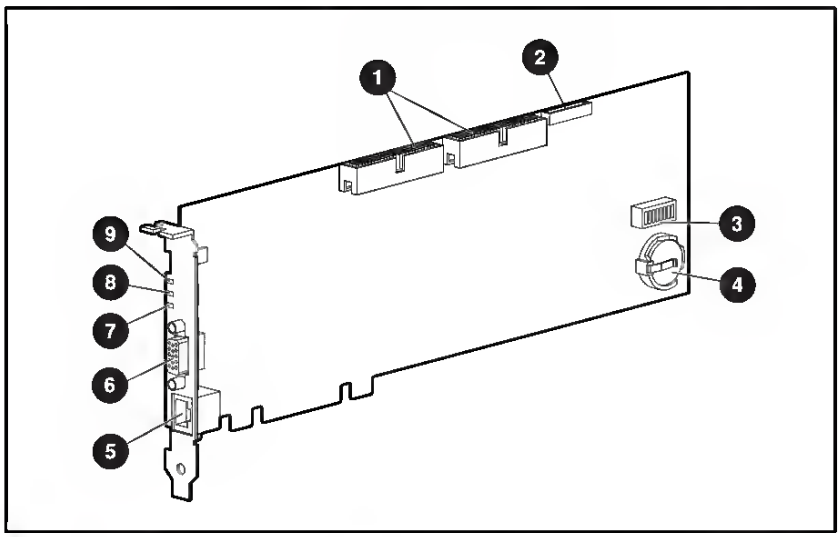

Figure 4-3. Server Feature Board components (ProLiant ML330e server)

Table 4-3
Server Feature Board Components (ProLiant ML330e Server)

Item	Description	Item	Description
❶	ATA channel connector	❻	Video connector
❷	Server Management Information Cable (SMIC) connector	❼	Network speed indicator
❸	Server Feature Board configuration switch	❽	Network link indicator
❹	Replaceable lithium coin cell battery (CR2032)	❾	Network activity indicator
❺	RJ-45 Ethernet connector for NIC		

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Server Feature Board Components (ProLiant ML330 Server)

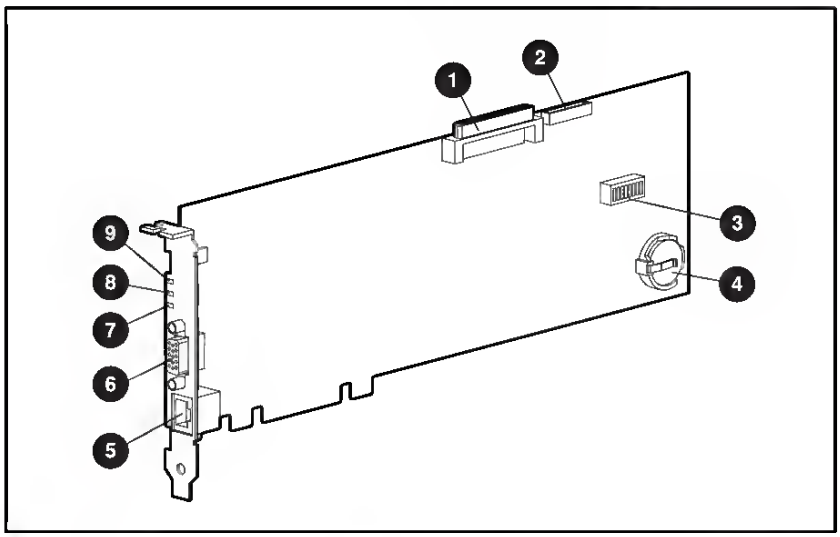

Figure 4-4. Server Feature Board components (ProLiant ML330 server)

Table 4-4
Server Feature Board Components (ProLiant ML330 Server)

Item	Description	Item	Description
❶	SCSI channel connector	❻	Video connector
❷	Server Management Information Cable (SMIC) connector	❼	Network speed indicator
❸	Server Feature Board configuration switch	❽	Network link indicator
❹	Replaceable lithium coin cell battery (CR2032)	❾	Network activity indicator
❺	RJ-45 Ethernet connector for NIC		

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Switches

This section contains graphics and tables showing switch locations on the ProLiant ML330e/ML330 server system board and Server Feature Board.

Reserved Processor Switch Settings (SW1)

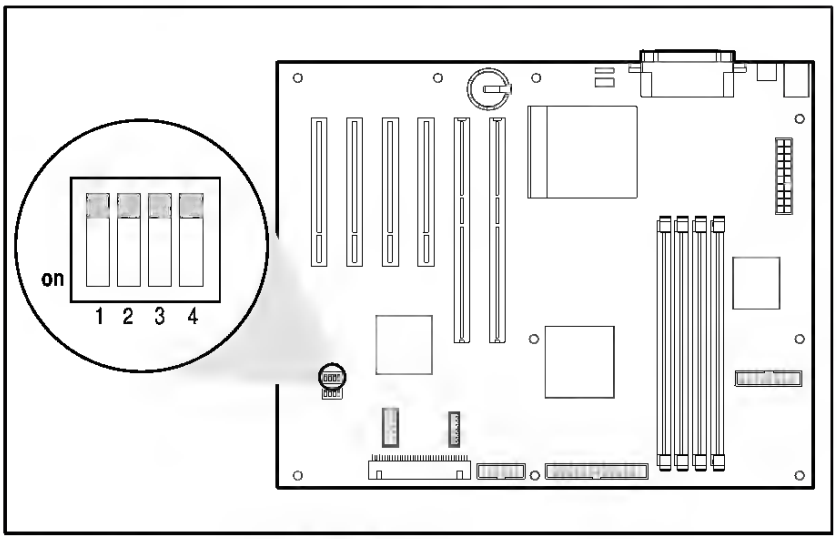

Figure 4-5. Reserved processor switch settings (SW1)

Table 4-5
Reserved Processor Switch Settings (SW1)

Switch	Default	Description
1	Off	Reserved
2	Off	Reserved
3	Off	Reserved
4	Off	Reserved

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System Configuration Switch Settings (SW2)

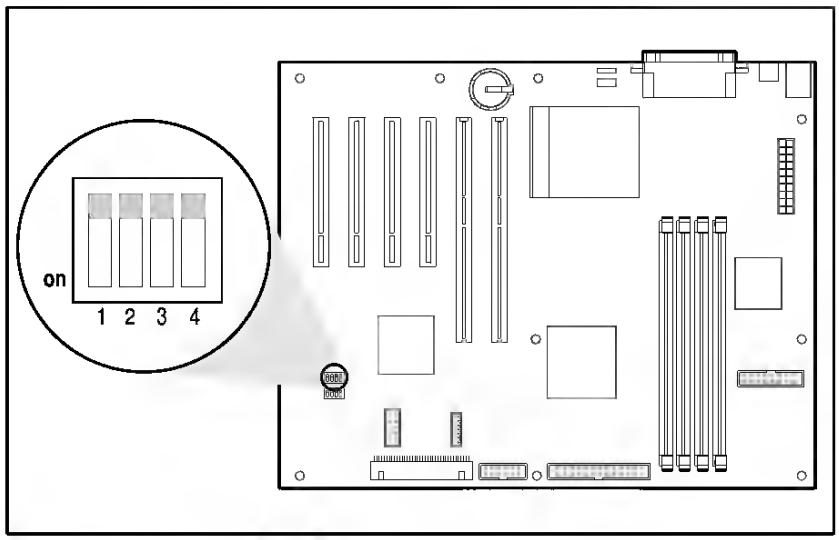

Figure 4-6. System configuration switch settings (SW2)

Table 4-6
System Configuration Switch Settings (SW2)

Switch	Default	Function	Description	Settings
1	Off	Clear/set up password	Used to disable password	Off = Password enabled On = Password disabled
2	Off	Clear CMOS and NVRAM	Used to clear system configuration settings	Off = Normal On = When server is powered up, all system configuration information is erased
3	Off	ROMPaq disaster recovery enable	Used to enable ROMPaq disaster recover mode when system ROM is corrupted	Off = Normal server operations mode On = ROMPaq disaster recovery mode
4	Off	Reserved		

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Server Feature Board Switch Settings (SW1)

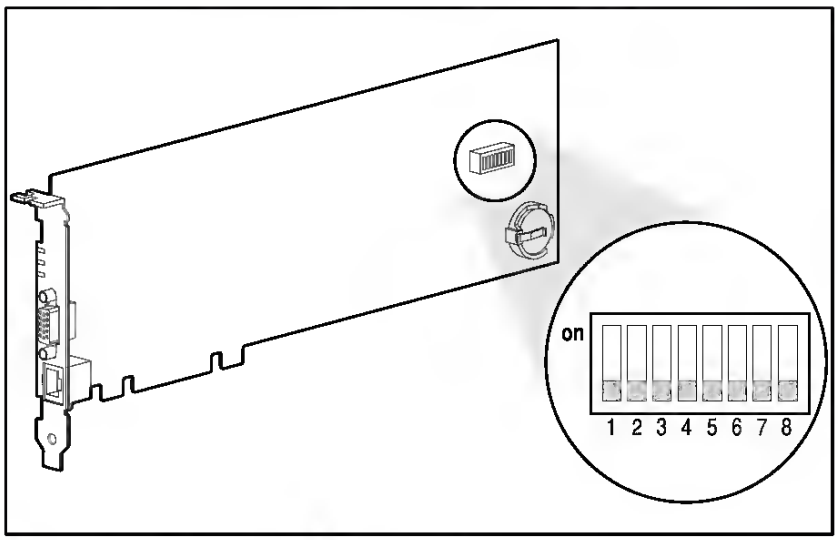

Figure 4-7. Server Feature Board switch settings (SW1)

Table 4-7
Server Feature Board Switch Settings (SW1)

Switch	Default	Function	Description	Settings
1	Off	Enable embedded video	Used to disable the onboard video controller when an optional video adapter is installed.	Off = Embedded video is enabled On = Embedded video is disabled
2	Off	Reserved		
3	Off	Reserved		
4	Off	Reserved		
5	Off	Reserved		
6	Off	Reserved		
7	Off	Reserved		
8	Off	Reserved		

IMPORTANT: Positions 2 through 8 are reserved for Compaq authorized service providers only. Do not change these switches from the indicated default settings.

NOTE: For information on troubleshooting video problems, refer to "Video Problems" in the *Compaq Servers Troubleshooting Guide.*

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Voltage Regulator Switch

Set the voltage regulator switch to either 115 volts or 230 volts, as appropriate for your location.

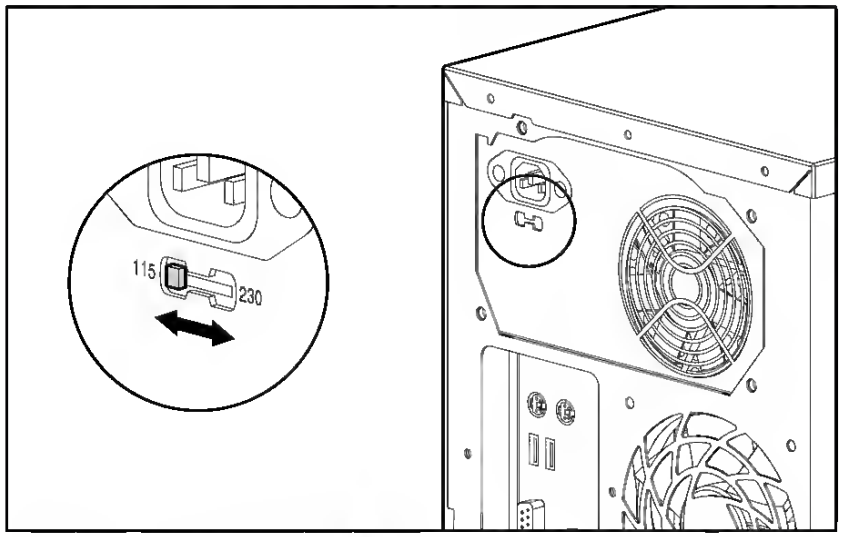

Figure 4-8. Voltage regulator switch location

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LEDs

This section contains graphics information on the following LEDs:

- System status LEDs
- Network controller status LEDs

System Status LEDs

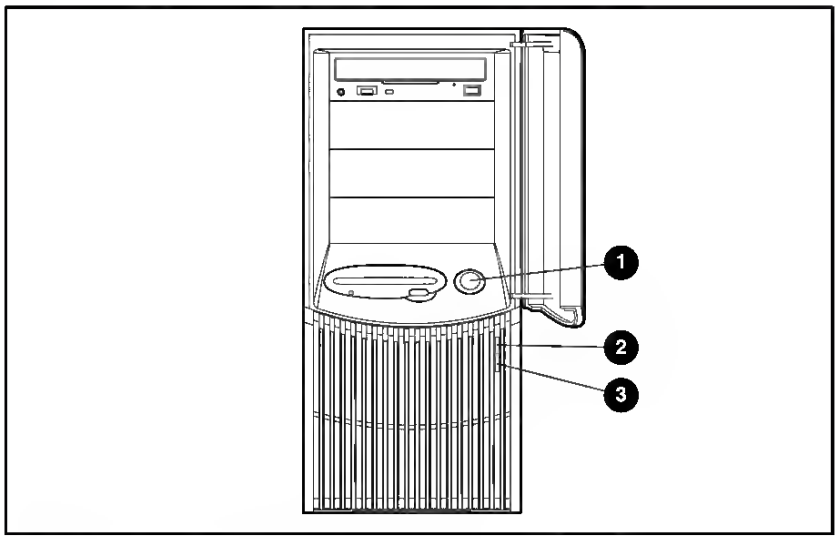

Figure 4-9. System status power button LEDs

Table 4-8
System Status LEDs

Item	Status	Description
❶ Power button	System on	Dn
❷ Power status	System on, AC power DK. Do not remove power from system.	Dn or off
	System off, no AC power	Dff
❸ Hard drive activity status	Drive being accessed	Dn or flashing
	Drive not being accessed	Off

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Network Controller LEDs

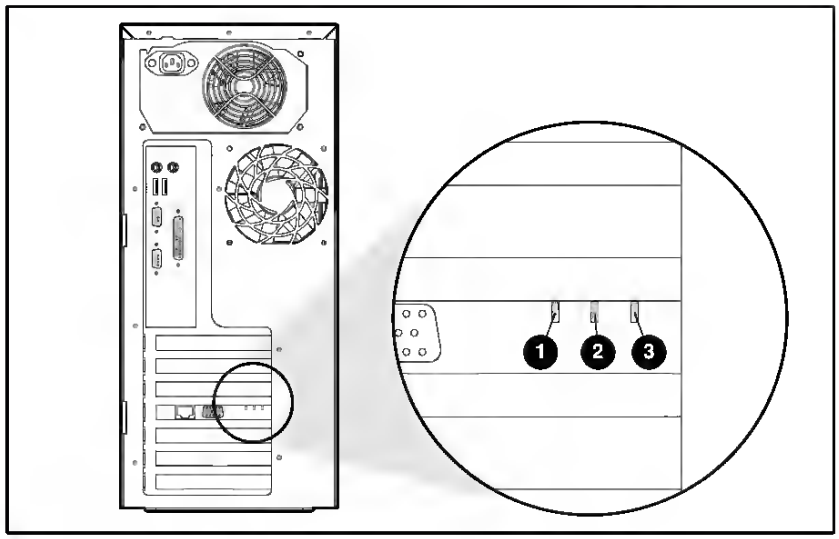

Figure 4-10. Network controller LEDs

Table 4-9
Network Controller LEDs

Item	Description	Status	Condition
❶	Speed	Off	10Base-T 10-Mbps (10Base-T Ethernet)
		On	100Base-TX 100-Mbps (100Base-TX Ethernet)
❷	Link	Off	No network link
		On	Linked to network
❸	Activity	Off	No network activity
		On or flashing	Network activity

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Chapter 5

Physical and Operating Specifications

This chapter provides specifications for the Compaq ProLiant ML330e/ML330 server. The following specifications are provided:

- System Unit
- Memory
- 1.44-MB Diskette Drive
- IDE CD-ROM Drive
- Wide Ultra2 SCSI Hard Drives for the ProLiant ML330 Server
- ATA Hard Drives for the ProLiant ML330e Server
- Integrated 10/100 Wake on LAN Network Interface Controller (NIC)
- Integrated Single-Channel Wide Ultra2 SCSI Controller
- Integrated Ultra ATA 100 Controller

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System Unit

Table 5-1
System Unit Specifications

Dimensions	
Height	42.86 mm (16.88 in)
Width	19.05 mm (7.5 in)
Depth	50.8 mm (20 in)
Weight	10.1 kg (26 lb) weight approximate, depending upon options
International input requirements	
Rated input voltage	180 VAC to 264 VAC
Rated input frequency	50 Hz to 60 Hz
Rated input current	3 A
U.S. input requirements	
Rated input voltage	90 VAC to 132 VAC
Rated input frequency	50 Hz to 60 Hz
Rated input current	6 A
Power supply output power	
Rated steady state power	CE Mark-compliant
BTUs for tower model	1,560
Temperature range	
Operating	10°C to 35°C/50°F to 93°F
Nonoperating	-30°C to 60°C /-22°F to 140°F
Relative humidity (noncondensing)	
Operating	20% to 80%
Nonoperating	5% to 90%
Acoustic noise	
Idle (hard drives spinning)	6 NPEL (Bels)/43 AVERAGE SPL (dba)
Operating (random seeks to hard drives)	6.1 NPEL (Bels)/44 AVERAGE SPL (dba)

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Memory

Table 5-2
Memory Specifications

Size	64-, 128-, 256-, and 512-MB, and 1-GB
Speed	PC 133-MHz
Type	ECC Registered SDRAM DIMMs

1.44-MB Diskette Drive

Table 5-3
1.44-MB Diskette Drive Specifications

Size	8.89 mm (3.5 in)
LED indicators (front panel)	Green
Read/write capacity per diskette (high/low density)	1.44 MB/720 KB
Drives supported	1
Drive height	Third, 1 inch
Drive rotation	300 rpm
Transfer rate bits/sec (high/low)	500 Kbps/250 Kbps
Bytes/sector	512
Sectors per rack (high/low)	18/9
Tracks per side (high/low)	80/80
Access times	
Track-to-track (high/low)	3 ms/6 ms
Average (high/low)	169 ms/94 ms
Settling time	15 ms
Latency average	100 ms
Cylinders (high/low)	80/80
Read/write heads	2

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IDE CD-ROM Drive

Table 5-4
IDE CD-ROM Specifications

Applicable disk	CD-ROM (modes 1 and 2); mixed mode (audio and data combined); CD-DA; Photo CD (single- and multiple-session), CD-XA (mode 2, forms 1 and 2); CDI ready; CD-WO
Capacity	650 MB
Rotational speed	5,200 rpm
Block size	2,328 bytes (CD-XA)
	2,340, 2,336, 1,024 bytes (mode 2)
	2,048, 1,024 bytes (mode 1)
	2,352 bytes (CD-DA)
Dimensions	
Height	42.9 mm (1.69 in)
Width	208.0 mm (8.2 in)
Depth	150.1 mm (5.91 in)
Weight	0.950 kg (2.09 lb)
Data transfer rate	
Sustained	150 KBps (single), 1,500 to 4,800 KBps (10X to 32X)
Burst	150 KBps to 4,800 KBps
Interface	IDE (ATAPI)
Access times (typical)	
Full stroke	<150 ms
Random	<100 ms
Diameter	12 cm, 8 cm (4.7 in, 3.15 in)
Center hole	15 mm (0.6 in)
Thickness	1.2 mm (0.05 inch)
Track pitch	1.6 µm
Cache/buffer	128 KB
Startup time	<7 seconds
Stop time	<4 seconds

continued

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Table 5-4
IDE CD-ROM Specifications *continued*

Laser parameters	
Type	Semiconductor Laser GaA1As
Wave length	780 ± 25 nm
Divergence angle	53.5° ± 1.5°
Output power	0.14 mW
Operating conditions	
Temperature	5°C to 45°C (41°F to 113°F)
Humidity	5% to 90% (10% to 80%)

ATA Hard Drives (ProLiant ML330e Server)

Table 5-5
ATA Hard Drive (ProLiant ML330e Server) Specifications

	20 GB 7.2K rpm
Capacity	20,020.0 MB
Height	25.4 mm (1 in)
Width	88.9 mm (3.5 in)
Interface	ATA 100 16-bit
Transfer rate synchronous (max)	100 MBps
Seek time (typical, including setting)	
Single track	1.0 ms
Average	<8.7 ms
Full stroke	<20.0 ms
Rotational speed	7,200 rpm
Physical configuration	
Bytes/sector	512
Operating temperature	
Celsius	10° to 35°
Fahrenheit	59° to 95°

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Wide Ultra2 SCSI Hard Drives (ProLiant ML330 Server)

Table 5-6
Wide Ultra2 SCSI Hard Drive (ProLiant ML330 Server) Specifications

	9.1 GB 7.2 K rpm	9.1 GB 10 K rpm
Capacity	9,100.0 MB	9,100.0 MB
Height	25.4 mm (1 in)	25.4 mm (1 in)
Width	88.9 mm (3.5 in)	88.9 mm (3.5 in)
Interface	Wide Ultra2 SCSI	Wide Ultra2 SCSI
Transfer rate synchronous (max)	80 MBps	80 MBps
Seek time (typical, including setting)		
Single track	1.9 ms	0.8 ms
Average	7.5 ms	5.4 ms
Full stroke	15.0 ms	12.2 ms
Rotational speed	7,200 rpm	10,000 rpm
Physical configuration		
Bytes/sector	512	512
Logical blocks	17,773,524	17,773,524
Operating temperature		
Celsius	10° to 35°	10° to 35°
Fahrenheit	59° to 95°	59° to 95°

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Integrated 10/100 Wake on LAN Network Interface Controller

Table 5-7
Integrated 10/100 Wake on LAN NIC Specifications

Network interface	10Base-T/100Base-TX
Compatibility	IEEE 802.2, 802.3, 802.3u
Data transfer method	32-bit, PC 33-MHz bus master
Network transfer rate	10/100 Mbps
Connector	RJ-45
I/O address and interrupt	Plug and Play PCI
Compliance	PCI 2.2 and 2.1
OS support (ProLiant ML330 server)	Microsoft Windows NT 4.0, Microsoft Windows NT server 4.0, Microsoft Windows 2000 Server, Terminal Server Edition 4.01, Red Hat Linux, SuSE Linux, TurboLinux, Caldera OpenLinux eServer, Novell NetWare 3.2, 4.2, 5.0, 5.1, Novell Small Business Suite 4.2, 5.0, SCO OpenServer 5.05, SCO UnixWare 7.1, 7.1.1
OS support (ProLiant ML330e server)	Microsoft Windows NT 4.0, Microsoft Windows NT server 4.0, Microsoft Windows 2000 Server (when available), Terminal Server Edition 4.01, Microsoft Small Business Server 2000, Red Hat Linux, SuSE Linux, TurboLinux, Caldera OpenLinux eServer,

Integrated Single-Channel Wide Ultra2 SCSI Controller

Table 5-8
Integrated Single-Channel Wide Ultra2 SCSI Controller Specifications

Protocol	Wide Ultra2 SCSI
Compatibility	All PCI server configurations are backward compatible with Wide Ultra2 SCSI devices
Drives supported	Up to 7 SCSI devices per channel
Data transfer method	32-bit PCI bus-master
Maximum transfer rate per PCI Bus (peak)	133 MBps
SCSI channel transfer rate	80 MBps per channel
SCSI termination	Active termination
SCSI connectors	1 internal

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Integrated Ultra ATA 100 Controller

Table 5-9
Integrated Ultra ATA 100 Controller Specifications

Protocol	Ultra ATA 100
Drives supported	Up to 2 ATA devices per channel
Data transfer method	32-bit PCI bus-master
Maximum transfer rate per PCI Bus (peak)	133 MBps
ATA channel transfer rate	100 MBps per channel
ATA connectors	2 internal

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